

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	8	("5160712" "5264201" "5370948" "5393622" "5629110" "5985237" "6416902" "6660432").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 16:48
L2	1	L1 and (primary adj particle same secondary adj particle)	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 16:47
S2	8	("5160712" "5264201" "5370948" "5393622" "5629110" "5985237" "6416902" "6660432").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2006/05/11 16:03
S3	1	10/629815	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 13:14
S4	1	S3 and twin\$4	US-PGPUB; USPAT; USOCR	OR	ON	2006/05/19 17:46
S6	1	10/629815	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 13:14
S7	1	S6 and quench\$3	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 13:52
S8	6	((("2003082452") or ("6660432") or ("6368749") or ("6165647") or ("6333128") or ("5993998") or ("5795558"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/08/29 13:54
S9	6	((("2003082452") or ("2005260496") or ("6660432") or ("6368749") or ("6165647") or ("6333128") or ("5993998") or ("5795558"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/08/29 14:01
S10	5078	429/209-231.3.ccls. and @ad<"20020805"	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 13:58
S11	1842	429/220,223,224.ccls. and @ad<"20020805"	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 13:58
S12	29	S11 and twin\$3	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 13:59
S13	2	S11 and (superlattice super adj lattice)	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 14:00
S14	2	S10 and r3-m	US-PGPUB; USPAT; USOCR	OR	ON	2006/08/29 16:46

file reg		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	0.21	0.21

FILE 'REGISTRY' ENTERED AT 13:32:33 ON 29 AUG 2006  
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=> s (0.95-1.05)/Li and (0-0.3)/Co and (0.4-0.6)/Ni and (0.4-0.6)/Mn and 2/O
      101958 (0.95-1.05)/LI
      12295 (0-0.3)/CO
      5307 (0.4-0.6)/NI
      5209 (0.4-0.6)/MN
      5786511 2/O
L1      137 (0.95-1.05)/LI AND (0-0.3)/CO AND (0.4-0.6)/NI AND (0.4-0.6)/MN
      AND 2/O
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=> file caplus		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	26.44	26.65

FILE 'CAPLUS' ENTERED AT 13:36:20 ON 29 AUG 2006  
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 FILE LAST UPDATED: 28 Aug 2006 (20060828/ED)

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=> s l1

L2 134 L1

=> s l1 and battery

134 L1

125298 BATTERY

98632 BATTERIES

136191 BATTERY

(BATTERY OR BATTERIES)

L3 133 L1 AND BATTERY

=> d 13 1-133 ibib kwic

L3 ANSWER 1 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:760223 CAPLUS

TITLE: Secondary nonaqueous electrolyte batteries containing lithium mixed oxide and secondary oxide in cathode active mass

INVENTOR(S): Yamada, Masayuki; Uchitomi, Kazutaka; Ueda, Atsushi; Kawai, Tetsuo; Hashimoto, Hiroshi

PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	JP 2006202702	A2	20060803	JP 2005-15935	20050124
PRIORITY APPLN. INFO.:				JP 2005-15935	20050124
TI	Secondary nonaqueous electrolyte batteries containing lithium mixed oxide and secondary oxide in cathode active mass				
AB	The disclosed batteries have cathode active mass containing (1) $\text{Li}(1+\delta)\text{Mn}_x\text{Ni}_y\text{Co}(1-x-y)\text{O}_2$ ( $-0.15 < \delta < 0.15$ ; $0.1 < x \leq 0.5$ ; $0.5 < x + y \leq 1.0$ ) and (2) oxide containing M (M = Ti, Zr, Nb, Mo, W, Al, Si, Ga, Ge, and/or Sn), preferably having a composition represented by $\text{Li}_2\text{MO}$ . The batteries have high capacity, safety, excellent high-voltage cycling performance, and storage stability.				
ST	nonaq electrolyte battery cathode active mass capacity safety; battery cathode lithium manganese nickel cobalt oxide				
IT	Battery cathodes				
	(nonaq. electrolyte batteries containing Li-Mn-Ni-Co oxide and secondary oxide in cathode active mass for high capacity and safety)				
IT	10102-24-6, lithium silicon oxide ( $\text{Li}_2\text{SiO}_3$ ) 12031-82-2, Lithium titanium oxide ( $\text{Li}_2\text{TiO}_3$ ) 12031-83-3, lithium zirconium oxide ( $\text{Li}_2\text{ZrO}_3$ ) 12057-23-7, Lithium molybdenum oxide ( $\text{Li}_2\text{MoO}_3$ ) 12188-25-9, Lithium tin oxide ( $\text{Li}_2\text{SnO}_3$ ) 12315-28-5, Germanium lithium oxide ( $\text{GeLi}_2\text{O}_3$ ) 86291-88-5, Lithium tungsten oxide ( $\text{Li}_2\text{WO}_3$ ) 212324-48-6, Lithium niobium oxide ( $\text{Li}_2\text{NbO}_3$ ) 904299-06-5 904299-07-6 904299-09-8 904299-11-2 904299-14-5				
	RL: DEV (Device component use); USES (Uses)				
	(nonaq. electrolyte batteries containing Li-Mn-Ni-Co oxide and secondary oxide in cathode active mass for high capacity and safety)				

L3 ANSWER 2 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:759963 CAPLUS

TITLE: Cathode active mass, its manufacture, and nonaqueous-electrolyte battery

INVENTOR(S): Nakagawa, Hiroe; Nukuta, Toshiyuki; Inamasu, Tokuo; Endo, Daisuke

PATENT ASSIGNEE(S): GS Yuasa Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13pp.

DOCUMENT TYPE: CODEN: JKXXAF  
LANGUAGE: Patent  
FAMILY ACC. NUM. COUNT: 1 Japanese  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2006202678	A2	20060803	JP 2005-15382	20050124
PRIORITY APPLN. INFO.:				JP 2005-15382	20050124
TI	Cathode active mass, its manufacture, and nonaqueous-electrolyte battery				
AB	The cathode active mass is manufactured by fluorination of a Li mixed oxide $\text{Li}_x\text{Ni}_a\text{Mn}_b\text{Co}_c\text{O}_z$ ( $0 < x \leq 1.3$ ; $0 < a < 1$ ; $0 < b < 0.6$ ; $0 < c < 1$ ; $a + b + c = 1$ ; and $z = 1.7-2.3$ ) having $\alpha$ - $\text{NaFeO}_2$ -layered structure. The battery provides high discharge capacity and long cycle life after high-temperature storage.				
ST	cathode lithium nickel manganese cobalt oxide fluorination battery				
IT	Battery cathodes Fluorination (fluorination of lithium mixed oxide cathode for nonaq.-electrolyte battery)				
IT	Secondary batteries (lithium; fluorination of lithium mixed oxide cathode for nonaq.-electrolyte battery)				
IT	7782-41-4, Fluorine RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process) (fluorination by; fluorination of lithium mixed oxide cathode for nonaq.-electrolyte battery)				
IT	390362-01-3DP, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.5}\text{LiMn}_{0.25}\text{Ni}_{0.25}\text{O}_2$ ), fluorinated 532934-38-6DP, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.34}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ), fluorinated 532934-40-0DP, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.16}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ), fluorinated 763122-46-9DP, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.84}\text{LiMn}_{0.08}\text{Ni}_{0.08}\text{O}_2$ ), fluorinated 904297-35-4DP, fluorinated RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (fluorination of lithium mixed oxide cathode for nonaq.-electrolyte battery)				

L3 ANSWER 3 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:759813 CAPLUS  
TITLE: Secondary nonaqueous electrolyte batteries containing lithium manganese nickel cobalt mixed oxide cathode active mass particles  
INVENTOR(S): Yamada, Masayuki; Uchitomi, Kazutaka; Ueda, Atsushi; Kawai, Tetsuo; Hashimoto, Hiroshi  
PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2006202647	A2	20060803	JP 2005-14483	20050121
PRIORITY APPLN. INFO.:				JP 2005-14483	20050121
TI	Secondary nonaqueous electrolyte batteries containing lithium manganese nickel cobalt mixed oxide cathode active mass particles				
AB	The disclosed batteries contain cathode active mass particles with a composition represented by $\text{Li}_{(1+\delta)}\text{Mn}_x\text{Ni}_y\text{Co}_{(1-x-y-z)}\text{M}_z\text{O}_2$ [ $\text{M} = \text{Ti}, \text{Zr}, \text{Nb}, \text{Mo}, \text{W}, \text{Al}, \text{Si}, \text{Ga}, \text{Ge}, \text{Sn}$ ; $-0.15 < \delta < 0.15$ ; $0.1 < x \leq$				

0.5;  $0.6 < x + y + z \leq 1.0$ ;  $0.9 < x/y < 1.1$ ;  $0 < z \leq 0.1$ ],  
and the atomic ratio of M to Mn, Ni, and Co in the particle surface (a) is  
higher than the average atomic ratio of M to Mn, Ni, and Co in the whole particle  
[ $z/(1-z)$ ]. The batteries have high capacity, safety, excellent  
high-voltage cycling performance, and storage stability.

ST nonaq electrolyte battery cathode active mass particle;  
battery cathode lithium manganese nickel cobalt mixed oxide  
particle

IT Battery cathodes  
(nonaq. electrolyte batteries containing Li-Mn-Ni-Co-M oxide  
cathode active mass particles with composition distribution for high  
capacity and safety)

IT 904301-28-6 904301-30-0 904301-32-2 904301-34-4 904301-36-6  
904301-38-8 904301-39-9 904301-40-2  
904301-41-3 904301-42-4 904301-43-5  
904301-44-6 904301-45-7 904301-46-8  
904301-47-9 904301-48-0

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte batteries containing Li-Mn-Ni-Co-M oxide  
cathode active mass particles with composition distribution for high  
capacity and safety)

L3 ANSWER 4 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:699896 CAPLUS

DOCUMENT NUMBER: 145:149098

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Muraoka, Yoshiyuki; Nakashima, Takuya; Kozuki, Kiyomi;  
Nagayama, Masatoshi

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: PCT Int. Appl., 21 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006075684	A1	20060720	WO 2006-JP300343	20060113
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			

JP 2006222072 A2 20060824 JP 2005-377954 20051228

PRIORITY APPLN. INFO.: JP 2005-7401 A 20050114

JP 2005-377954 A 20051228

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Secondary nonaqueous electrolyte battery

AB The battery has a cathode containing a Li-intercalating composite  
oxide active mass, a Li-intercalating anode, a separator between the 2  
electrodes, and an electrolyte solution containing a nonaq. solvent; where the  
discharge curve at constant-output discharging of the battery has  
 $\geq 2$  step-form inflexion points in a region ranging from 5% to 20% of  
a discharge capacity at a discharging terminal obtained during a period  
between a discharging start voltage in a fully charged state and a  
discharging end voltage.

ST secondary battery structure large current discharge

IT Secondary batteries  
(structure of secondary batteries for large current discharge)

IT 12162-79-7, Lithium manganese oxide (LiMnO<sub>2</sub>) 160151-72-4, Cobalt lithium oxide (CoLi<sub>0.95</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(structure of secondary batteries for large current discharge)

IT 474082-23-0, Aluminum cobalt lithium nickel oxide (Al<sub>0.05</sub>Co<sub>0.15</sub>Li<sub>0.95</sub>Ni<sub>0.8</sub>O<sub>2</sub>) 899217-29-9, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>Li<sub>0.95</sub>Mn<sub>0.35</sub>Ni<sub>0.35</sub>O<sub>2</sub>) 899217-30-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>0.95</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 899217-31-3, Aluminum cobalt lithium nickel oxide (Al<sub>0.15</sub>Co<sub>0.3</sub>Li<sub>0.95</sub>Ni<sub>0.55</sub>O<sub>2</sub>)  
RL: MOA (Modifier or additive use); USES (Uses)  
(structure of secondary batteries for large current discharge)

L3 ANSWER 5 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:632965 CAPLUS

DOCUMENT NUMBER: 145:106782

TITLE: Lithium secondary batteries, their cathodes, double oxide powders therefor, and manufacture of the same

INVENTOR(S): Shizuka, Kenji; Okahara, Kenji

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 27 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2006172753	A2	20060629	JP 2004-360142	20041213
PRIORITY APPLN. INFO.:				JP 2004-360142	20041213
TI	Lithium secondary batteries, their cathodes, double oxide powders therefor, and manufacture of the same				
AB	Powders of Li <sub>1+z</sub> Ni <sub>x</sub> Mn <sub>y</sub> Co <sub>1-x-y</sub> O <sub>2</sub> (0.20 ≤ x ≤ 0.55; 0.20 ≤ y ≤ 0.60; 0.50 ≤ x + y ≤ 1; 0.02 ≤ z ≤ 0.55) and S content 0.06-0.35%, are manufactured by the following steps; pulverizing Ni compds., Mn compds., sulfates, and optionally Co compds. in liquid media to average diameter ≤ 0.3 μm, slurring, atomizing by spraying to allow primary particles to aggregate, mixing the resulting secondary particles with Li compds., and firing the mixts. in O-containing gases. Li secondary batteries having the powders as cathode active mass which suppresses rise in pH and avoids gas emission.				
ST	lithium secondary battery cathode double oxide manuf; sulfur content lithium nickel manganese oxide battery cathode; pH rise suppressed double oxide battery cathode				
IT	Secondary batteries (lithium; manufacture of lithium nickel manganese oxide powders of prprescribed S content for Li secondary batteries)				
IT	Battery cathodes (manufacture of lithium nickel manganese oxide powders of prprescribed S content for Li secondary batteries)				
IT	7704-34-9, Sulfur, uses RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses) (cathode active mass containing; manufacture of lithium nickel manganese oxide powders of prprescribed S content for Li secondary batteries)				
IT	868658-11-1P, Cobalt lithium manganese nickel oxide (Co <sub>0.34</sub> Li <sub>1.09</sub> Mn <sub>0.33</sub> Ni <sub>0.33</sub> O <sub>2</sub> ) 895149-47-0P, Cobalt lithium manganese nickel oxide (Co <sub>0.34</sub> Li <sub>1.06</sub> Mn <sub>0.33</sub> Ni <sub>0.32</sub> O <sub>2</sub> ) 895149-50-5P, Cobalt lithium manganese nickel oxide (Co <sub>0.35</sub> Li <sub>1.06</sub> Mn <sub>0.32</sub> Ni <sub>0.33</sub> O <sub>2</sub> ) 895149-52-7P, Cobalt lithium manganese nickel oxide (Co <sub>0</sub> -0.6Li <sub>1.02</sub> -1.55Mn <sub>0.2</sub> -0.6Ni <sub>0.2</sub> -				

0.5502)

RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)

(cathode active mass; manufacture of lithium nickel manganese oxide powders  
of prescribed S content for Li secondary batteries)

L3 ANSWER 6 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:579780 CAPLUS

DOCUMENT NUMBER: 145:48607

TITLE: Energy storage device and module thereof for use in  
electric vehicle

INVENTOR(S): Arai, Juichi; Kumashiro, Yoshiaki; Yoshikawa,  
Masanori; Kobayashi, Mituru; Yamaki, Takahiro

PATENT ASSIGNEE(S): Japan

SOURCE: U.S. Pat. Appl. Publ., 18 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	US 2006124973	A1	20060615	US 2005-299742	20051213
	JP 2006172775	A2	20060629	JP 2004-360659	20041214
PRIORITY APPLN. INFO.:				JP 2004-360659	A 20041214
ST	energy storage device module elec vehicle use; battery module elec vehicle use				
IT	Battery cathodes Battery electrolytes Electric vehicles Energy storage systems (energy storage device and module thereof for use in elec. vehicle)				
IT	Secondary batteries (lithium; energy storage device and module thereof for use in elec. vehicle)				
IT	71-43-2D, Benzene, derivative 96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 110-86-1D, Pyridine, derivative 287-92-3D, Cyclopentane, derivative 463-79-6D, Carbonic acid, cyclic ester 463-79-6D, Carbonic acid, ester 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0D, Dioxolane, derivative 1120-71-4D, Propane sultone, derivative 1332-29-2, Tin oxide 2926-29-6, Sodium trifluoromethanesulfinate 3741-38-6D, Ethylene sulfite, derivative 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7631-86-9, Silicon oxide, uses 7647-14-5, Sodium chloride, uses 7647-15-6, Sodium bromide (NaBr), uses 7681-82-5, Sodium iodide, uses 10377-51-2, Lithium iodide 11113-67-0, Iron lithium oxide 11113-84-1, Ruthenium oxide 12005-86-6, Sodium hexafluoroarsenate 13463-67-7, Titanium oxide, uses 13755-29-8, Sodium tetrafluoroborate 13824-63-0, Cobalt lithium phosphate colipo4 14283-07-9, Lithium tetrafluoroborate 15290-77-4, 1,1,2,2,3,3,4-Heptafluorocyclopentane 15365-14-7, Iron lithium phosphate felipo4 16734-12-6D, Disulfide, derivative 21324-39-0, Sodium hexafluorophosphate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 39300-70-4, Lithium nickel oxide 39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt lithium oxide 90076-65-6 91742-21-1 132404-42-3 132843-44-8 152894-04-7 156088-05-0 164982-97-2 412030-34-3, Lithium tetrakis(trifluoroacetoxy)borate 412030-35-4, Lithium tetrakis(pentafluoropropoxy)borate 607706-67-2, Cobalt lithium manganese nickel oxide ((Co,Mn,Ni)LiO2) 757954-84-0, Chromium lithium phosphate (CrO-1LiO-2(PO4)) 889766-69-2 889766-70-5				
RL: DEV (Device component use); USES (Uses)	(energy storage device and module thereof for use in elec. vehicle)				

L3 ANSWER 7 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:558888 CAPLUS

DOCUMENT NUMBER: 145:66269

TITLE: Cathode active materials for nonaqueous electrolyte secondary batteries and method for their manufacture

INVENTOR(S): Yamanaka, Atsushi; Miyashiro, Hajime; Kobayashi, Akira; Seki, Shiro

PATENT ASSIGNEE(S): Sumitomo Metal Mining Co., Ltd., Japan; Central Research Institute of Electric Power Industry

SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	-----
	JP 2006156032	A2	20060615	JP 2004-342544	20041126
PRIORITY APPLN. INFO.:				JP 2004-342544	20041126
TI	Cathode active materials for nonaqueous electrolyte secondary batteries and method for their manufacture				
AB	The title cathode active materials are powders having composition formula $\text{Li}_x\text{MO}_y$ ( $\text{M} = \text{Co}, \text{Mn}, \text{Ni}, \text{V}, \text{and/or Fe}$ ; $x = 0.02\text{-}2.2$ ; $y = 1.4\text{-}3$ ) that are uniformly equipped with coatings of 1.5-8.5 weight% (based on the total powder) $\text{ZrO}_2$ . The said materials are manufactured by formation of a fluidized bed of the powder by feeding hot air and heating to $\geq 35^\circ$ , addition of zirconia sol to the bed for formation of the coating, and firing at $400\text{-}650^\circ$ . Batteries having excellent cycle characteristics and high-temperature storage stability can be obtained from the materials.				
ST	zirconia coated lithium mixed oxide cathode active material; nonaq electrolyte secondary battery cathode active material				
IT	Battery cathodes (coating of mixed lithium oxide powder with zirconia for preparation of cathode active materials in secondary batteries)				
IT	Secondary batteries (nonaq. electrolyte; coating of mixed lithium oxide powder with zirconia for preparation of cathode active materials in secondary batteries)				
IT	1314-23-4P, Zirconia, uses 890851-96-4P RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (coating of mixed lithium oxide powder with zirconia for preparation of cathode active materials in secondary batteries)				

L3 ANSWER 8 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:513062 CAPLUS

DOCUMENT NUMBER: 145:30870

TITLE: Lithium secondary batteries comprising nonaqueous electrolytes containing cyclic 1,2-propanediol sulfate

INVENTOR(S): Chao, Chin Pao; Aoyama, Shigeo

PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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	JP 2006140115	A2	20060601	JP 2004-331016	20041115
PRIORITY APPLN. INFO.:				JP 2004-331016	20041115



TI Lithium secondary batteries comprising nonaqueous electrolytes containing cyclic 1,2-propanediol sulfate

AB The nonaq. electrolytes of the title batteries contain 0.1-20 weight% 4-Methyl-2,2-dioxo-1,3,2-dioxathiolane. Preferably, the cathode contains layer- or spinel-structured Mn- and Li-containing mixed oxides, e.g.  $\text{Li}_x\text{Ni}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$  ( $0 < x \leq 1.1$ ),  $\text{Li}_x\text{Ni}_{5/12}\text{Mn}_{5/12}\text{Co}_{1/6}\text{O}_2$  ( $0 < x \leq 1.1$ ),  $\text{Li}_y\text{Mn}_2\text{O}_4$  ( $y = 0-2.1$ ). The batteries show excellent cycle characteristics and storage stability at high temperature

ST secondary lithium battery electrolyte solvent; cyclic propanediol sulfate battery electrolyte solvent

IT Battery cathodes  
(lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

IT Secondary batteries  
(lithium; lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

IT 12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 346417-97-8, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 889059-24-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{1-1.1}\text{Mn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 889059-25-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1-1.1}\text{Mn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 889059-26-1, Lithium manganese oxide ( $\text{Li}_{1-2.1}\text{Mn}_2\text{O}_4$ )  
RL: DEV (Device component use); USES (Uses)  
(cathode oxide; lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

IT 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte salt; lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Methyl ethyl carbonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solvent; lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

IT 5689-83-8  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte solvent; lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses 7440-32-6, Titanium, uses 7440-56-4, Germanium, uses 7440-67-7, Zirconium, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
(mixed oxide cathode containing; lithium secondary batteries with cyclic propanediol sulfate electrolyte solvents for excellent cycle characteristics)

L3 ANSWER 9 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:494303 CAPLUS  
DOCUMENT NUMBER: 145:11274  
TITLE: Secondary nonaqueous electrolyte battery  
INVENTOR(S): Ueda, Atsushi; Watanabe, Shoichiro; Yao, Takeshi; Takeuchi, Takashi; Shirane, Takayuki; Saito, Takaya; Nagata, Hiromi  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: PCT Int. Appl., 52 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006054604	A1	20060526	WO 2005-JP21046	20051116
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
JP 2006173099	A2	20060629	JP 2005-332000	20051116
PRIORITY APPLN. INFO.:			JP 2004-335661	A 20041119
REFERENCE COUNT:	32	THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		
TI	Secondary nonaqueous electrolyte battery			
AB	The battery, whose charge-terminating voltage is set at 4.25-4.5 V, has an anode, containing a Li-intercalating active mass, a cathode containing a Li composite oxide active mass, a separator between the 2 electrodes, and a nonaq. Li+-conductive electrolyte; where the battery satisfies $R = W_p/W_n = 1.3-1.9$ ( $W_p$ = weight of active mass contained in cathode per unit area; $W_n$ = weight of active mass contained in anode; $R$ = ratio of $W_p$ to $W_n$ ).			
ST	secondary battery cathode lithium composite oxide			
IT	Secondary batteries (lithium; cathodes containing lithium composite oxides and anodes containing Li-intercalating active mass for secondary lithium batteries)			
IT	113443-18-8, Silicon oxide (SiO) 193215-96-2, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.4</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) 372491-83-3, Aluminum cobalt lithium magnesium oxide (Al <sub>0.01</sub> Co <sub>0.94</sub> LiMg <sub>0.05</sub> O <sub>2</sub> ) RL: DEV (Device component use); USES (Uses) (cathodes containing lithium composite oxides and anodes containing Li-intercalating active mass for secondary lithium batteries)			
IT	96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 827-52-1, Cyclohexyl benzene 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-21-3, Silicon, uses 7440-24-6, Strontium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 113958-31-9, Titanium oxide (TiO <sub>0.4-2</sub> ) 137633-98-8, Manganese oxide (MnO <sub>0.4-2</sub> ) 888217-29-6, Magnesium oxide (MgO <sub>0.4-2</sub> ) 888217-30-9, Aluminum oxide (AlO <sub>0.4-2</sub> ) 888217-31-0, Nickel oxide (NiO <sub>0.4-2</sub> ) 888217-32-1, Zirconium oxide (ZrO <sub>0.4-2</sub> ) 888217-33-2, Molybdenum oxide (MoO <sub>0.4-2</sub> ) 888217-34-3, Tungsten oxide (WO <sub>0.4-2</sub> ) RL: MOA (Modifier or additive use); USES (Uses) (cathodes containing lithium composite oxides and anodes containing Li-intercalating active mass for secondary lithium batteries)			
L3	ANSWER 10 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN			
ACCESSION NUMBER:	2006:493544 CAPLUS			
DOCUMENT NUMBER:	144:491899			
TITLE:	Layered lithium nickel manganese mixed oxide powder for secondary lithium battery cathode material, and its use in the cathode and the battery			
INVENTOR(S):	Ishida, Yuko; Shizuka, Kenji; Okahara, Kenji			
PATENT ASSIGNEE(S):	Mitsubishi Chemical Corp., Japan			
SOURCE:	Jpn. Kokai Tokkyo Koho, 20 pp. CODEN: JKXXAF			
DOCUMENT TYPE:	Patent			

LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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	JP 2006134816	A2	20060525	JP 2004-325326	20041109
PRIORITY APPLN. INFO.:				JP 2004-325326	20041109
TI	Layered lithium nickel manganese mixed oxide powder for secondary lithium battery cathode material, and its use in the cathode and the battery				
AB	The powder is represented by $\text{Li}_{1+x}\text{Ni}_{1-y-z}\text{pMn}_y\text{Co}_z\text{M}_p\text{O}_2$ ( $x = 0-0.20$ ; $y = 0.25-0.5$ ; $z = 0-0.5$ ; $p = 0-0.2$ ; $y + z + p = 0.5-0.75$ ; $M = \text{Al, Fe, Ti, Mg, Cr, Ga, Cu, Zn, Nb, Zr}$ ) and satisfies particle disintegration evaluation value (a) $>70$ and $\leq 95\%$ (a is defined based on powder particle median diameter before and after pressurization between plates). The cathode has a cathode active mass layer containing the powder and a binder on a current collector, and the battery uses the cathode. The powder shows good coatability, and the battery shows high capacity and rate performance.				
ST	layered lithium nickel manganese mixed oxide powder battery cathode				
IT	Battery cathodes (layered Li Ni Mn mixed oxide powder for secondary Li battery cathode)				
IT	Secondary batteries (lithium; layered Li Ni Mn mixed oxide powder for secondary Li battery cathode)				
IT	346417-97-8P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 500912-67-4P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{1.05}\text{Mn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 887115-95-9P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.02}\text{Mn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (layered Li Ni Mn mixed oxide powder for secondary Li battery cathode)				

L3 ANSWER 11 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:462579 CAPLUS  
DOCUMENT NUMBER: 144:491843  
TITLE: Lithium manganese nickel cobalt oxide cathode active materials for secondary lithium batteries and secondary lithium batteries  
INVENTOR(S): Hara, Kenji; Yuasa, Toyotaka; Kasai, Masahiro  
PATENT ASSIGNEE(S): Shin-Kobe Electric Machinery Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	JP 2006127923	A2	20060518	JP 2004-315039	20041029
PRIORITY APPLN. INFO.:				JP 2004-315039	20041029
TI	Lithium manganese nickel cobalt oxide cathode active materials for secondary lithium batteries and secondary lithium batteries				
AB	The claimed cathode active materials have layer crystal structures, have chemical composition formula $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$ ( $0 < a \leq 1.2$ ; $x = 0.1-0.8$ ; $y = 0.1-0.44$ ; $z = 0.1-0.6$ ; $x + y + z = 1$ ), and have tapping d. $1.5-2.5 \text{ g/cm}^3$ or have 90% secondary particle accumulative frequency diameter $\leq 20 \mu\text{m}$ and a certain primary particle distribution within the secondary particle, i.e. the average primary particle size ratio of those in the central 20 area% to those in the peripheral 20 area% in the secondary particle				

crosscut section, is 0.1-1.2. The batteries are capable of high-rate discharging under extremely low temps.

ST layered lithium manganese nickel cobalt oxide battery cathode; secondary particle mixed nickel oxide battery cathode

IT Battery cathodes  
Electric vehicles  
(layer structured lithium manganese nickel cobalt oxide cathode active materials for secondary lithium batteries)

IT Secondary batteries  
(lithium; layer structured lithium manganese nickel cobalt oxide cathode active materials for secondary lithium batteries)

IT 217309-43-8, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 681160-59-8, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.4</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 887116-17-8, Cobalt lithium manganese nickel oxide (Co<sub>0.1-0.6</sub>Li<sub>0-1.2</sub>Mn<sub>0.1-0.8</sub>Ni<sub>0.1-0.4</sub>O<sub>2</sub>)  
887116-18-9, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>Li<sub>1.03</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 887116-20-3, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>Li<sub>1.03</sub>Mn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 887116-21-4, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>Li<sub>1.03</sub>Mn<sub>0.4</sub>Ni<sub>0.3</sub>O<sub>2</sub>)  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(cathode active material; layer structured lithium manganese nickel cobalt oxide cathode active materials for secondary lithium batteries)

L3 ANSWER 12 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:440374 CAPLUS  
DOCUMENT NUMBER: 144:491812  
TITLE: Preparation of lithium ion cell anode material of LiMnxCoyNil-x-yO<sub>2</sub>  
INVENTOR(S): Yang, Wensheng; Duan, Xue; Wang, Bei  
PATENT ASSIGNEE(S): Beijing University of Chemical Technology, Peop. Rep. China  
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 11 pp. CODEN: CNXXEV  
DOCUMENT TYPE: Patent  
LANGUAGE: Chinese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1767236	A	20060503	CN 2005-10102789	20050919

PRIORITY APPLN. INFO.: CN 2005-10102789 20050919

ST lithium ion cell battery anode manganese cobalt nickel oxide

IT Secondary batteries  
(lithium; preparation of lithium ion cell anode material of LiMnxCoyNil-x-yO<sub>2</sub>)

IT Battery anodes  
Crystallization  
Electric properties  
(preparation of lithium ion cell anode material of LiMnxCoyNil-x-yO<sub>2</sub>)

IT 146956-42-5P, Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.2</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
193215-96-2P, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 346417-97-8P, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 632287-15-1P, Cobalt lithium manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.5</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 887268-43-1P, Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.4</sub>Ni<sub>0.2</sub>O<sub>2</sub>)  
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(preparation of lithium ion cell anode material of LiMnxCoyNil-x-yO<sub>2</sub>)

L3 ANSWER 13 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:439731 CAPLUS  
DOCUMENT NUMBER: 144:436121

TITLE: Cathode material for secondary lithium battery  
 and its manufacture  
 INVENTOR(S): Kajiya, Yoshio; Tasaki, Hiroshi  
 PATENT ASSIGNEE(S): Nikko Materials Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 20 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006049001	A1	20060511	WO 2005-JP18843	20051013
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				

PRIORITY APPLN. INFO.: JP 2004-318718 A 20041102  
 REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Cathode material for secondary lithium battery and its  
 manufacture  
 ST secondary battery cathode lithium transition metal oxide  
 phosphorus content  
 IT Battery cathodes  
 (compns. and manufacture of cathode materials containing lithium transition  
 metal composite oxides with controlled phosphorus amts. for secondary  
 lithium batteries)  
 IT 12031-65-1P, Lithium nickel oxide (LiNiO<sub>2</sub>) 12057-17-9P, Lithium  
 manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>) 12190-79-3P, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 113066-89-0P, Cobalt lithium nickel oxide (Co<sub>0.2</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 118557-79-2P,  
 Cobalt iron lithium oxide (Co<sub>0.9</sub>Fe<sub>0.1</sub>LiO<sub>2</sub>) 128975-24-6P, Lithium  
 manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 134398-47-3P, Cobalt lithium  
 manganese oxide (Co<sub>0.9</sub>LiMn<sub>0.1</sub>O<sub>2</sub>) 193215-96-2P, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 196313-88-9P, Cobalt iron  
 lithium nickel oxide (Co<sub>0.1</sub>Fe<sub>0.1</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 245437-21-2P, Cobalt iron  
 lithium nickel oxide (Co<sub>0.2</sub>Fe<sub>0.1</sub>LiNi<sub>0.7</sub>O<sub>2</sub>) 346417-97-8P, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 399507-65-4P, Iron  
 lithium manganese oxide (Fe<sub>0.33</sub>LiMn<sub>0.67</sub>O<sub>2</sub>) 405890-07-5P, Iron lithium  
 manganese nickel oxide (Fe<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 872355-94-7P, Iron  
 lithium nickel oxide (Fe<sub>0.33</sub>LiNi<sub>0.67</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
 (Preparation); USES (Uses)  
 (compns. and manufacture of cathode materials containing lithium transition  
 metal composite oxides with controlled phosphorus amts. for secondary  
 lithium batteries)

L3 ANSWER 14 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:402355 CAPLUS

DOCUMENT NUMBER: 144:415971

TITLE: Method of preparation of conductive agent-cathode  
 active material composite for lithium secondary  
 battery

INVENTOR(S): Cheon, Sang-Eun; Yoo, Seok-Yoon; Yoon, Hye-Won; Kim,  
 Jae-Kyung

PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

SOURCE: Eur. Pat. Appl., 27 pp.

DOCUMENT TYPE: CODEN: EPXXDW  
 LANGUAGE: Patent  
 FAMILY ACC. NUM. COUNT: 1 English  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1653534	A1	20060503	EP 2005-110064	20051027
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
US 2006093920	A1	20060504	US 2005-258731	20051025
CN 1770516	A	20060510	CN 2005-10116672	20051026
JP 2006128119	A2	20060518	JP 2005-314501	20051028
PRIORITY APPLN. INFO.:			KR 2004-86630	A 20041028
REFERENCE COUNT:	16	THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		

TI Method of preparation of conductive agent-cathode active material composite for lithium secondary battery

AB The invention relates to a conductive agent/pos. active material composite for a lithium secondary battery. The composite includes a pos. active material capable of reversibly intercalating/deintercalating lithium ions, and a conductive agent on the surface of the pos. active material. The conductive agent comprises a first conductive agent having a sp. surface area ranging from about 200 to about 1500 m<sup>2</sup>/g and a second conductive agent having a sp. surface area of about 100 m<sup>2</sup>/g or less.

ST lithium secondary battery cathode conductive agent composite

IT Secondary batteries  
 (lithium; method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

IT Battery cathodes  
 Electric conductors  
 (method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

IT Carbon black, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

IT 1314-62-1, Vanadium oxide (V<sub>2</sub>O<sub>5</sub>), uses 1317-33-5, Molybdenum sulfide (MoS<sub>2</sub>), uses 12017-96-8, Chromium lithium oxide (CrLiO<sub>2</sub>) 12022-46-7, Iron lithium oxide (FeLiO<sub>2</sub>) 12031-65-1, Lithium nickel oxide (LiNiO<sub>2</sub>) 12039-13-3, Titanium sulfide (TiS<sub>2</sub>) 12057-17-9, Lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>) 12162-79-7, Lithium manganese oxide limno<sub>2</sub> 12162-87-7, Lithium vanadium oxide livo<sub>2</sub> 12162-92-4, Lithium vanadium oxide (LiV<sub>2</sub>O<sub>5</sub>) 12169-03-8, Lithium yttrium oxide (LiYO<sub>2</sub>) 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 12201-18-2, Lithium molybdenum sulfide (LiMoS<sub>2</sub>) 12209-15-3, Lithium scandium oxide lisco<sub>2</sub> 13568-36-0, Lithium nickel vanadium oxide (LiNiVO<sub>4</sub>) 55326-82-4, Lithium titanium sulfide litis<sub>2</sub> 218446-64-1, Aluminum cobalt lithium nickel oxide (Al<sub>0.04</sub>Co<sub>0.15</sub>LiNi<sub>0.81</sub>O<sub>2</sub>) 329025-35-6, Iron lithium phosphate (Fe<sub>2</sub>Li<sub>1-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-27-7, Iron lithium phosphate (Fe<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-28-8, Lithium vanadium phosphate (Li<sub>0-3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-29-9, Chromium lithium phosphate (Cr<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-30-2, Lithium manganese phosphate (Li<sub>0-3</sub>Mn<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-31-3, Cobalt lithium phosphate (Co<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-32-4, Copper lithium phosphate (Cu<sub>2</sub>Li<sub>0-3</sub>(PO<sub>4</sub>)<sub>3</sub>) 884323-33-5, Aluminum cobalt lithium nickel oxide (Al<sub>0-0.1</sub>Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-35-7, Chromium cobalt lithium nickel oxide (Cr<sub>0-0.1</sub>Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-37-9, Cobalt lithium manganese nickel oxide (Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Mn<sub>0-0.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-39-1, Cobalt iron lithium nickel oxide (Co<sub>0-0.5</sub>Fe<sub>0-0.1</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-41-5, Cobalt lithium magnesium nickel oxide (Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Mg<sub>0-0.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-45-9, Cobalt lanthanum lithium nickel oxide (Co<sub>0-0.5</sub>La<sub>0-0.1</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-47-1, Cerium cobalt lithium nickel oxide (Ce<sub>0-0.1</sub>Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>O<sub>2</sub>) 884323-48-2, Cobalt lithium nickel strontium oxide (Co<sub>0-0.5</sub>Li<sub>0.9-1.1</sub>Ni<sub>0-0.9</sub>Sr<sub>0-0.1</sub>O<sub>2</sub>) 884323-49-3, Cobalt

lithium nickel vanadium oxide (Co0-0.5Li0.9-1.1Ni0-0.9V0-0.1O2)  
 884323-50-6, Lithium manganese nickel vanadium oxide (Li0.9-1.1Mn0-0.5Ni0-0.9V0-0.1O2) 884323-51-7, Lithium manganese nickel strontium oxide (Li0.9-1.1Mn0-0.5Ni0-0.9Sr0-0.1O2) 884323-52-8, Cerium lithium manganese nickel oxide (Ce0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2) 884323-53-9, Lanthanum lithium manganese nickel oxide (La0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2)  
 884323-54-0, Lithium magnesium manganese nickel oxide (Li0.9-1.1Mg0-0.1Mn0-0.5Ni0-0.9O2) 884323-55-1, Iron lithium manganese nickel oxide (Fe0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2) 884323-56-2, Lithium manganese nickel oxide (Li0.9-1.1Mn0-0.6Ni0-0.9O2) 884323-58-4, Chromium lithium manganese nickel oxide (Cr0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2) 884323-59-5, Aluminum lithium manganese nickel oxide (Al0-0.1Li0.9-1.1Mn0-0.5Ni0-0.9O2)  
 884323-62-0 884323-64-2 884323-66-4, Cobalt lithium manganese nickel oxide (Co0-0.5Li0.9-1.1Mn0-0.6Ni0-0.9O2)  
 884323-69-7 884323-71-1 884323-73-3  
 884323-74-4 884323-75-5 884323-76-6  
 884323-77-7, Aluminum lithium nickel oxide (Al0-0.1Li0.9-1.1NiO2)  
 884323-78-8, Chromium lithium nickel oxide (Cr0-0.1Li0.9-1.1NiO2)  
 884323-79-9, Lithium manganese nickel oxide (Li0.9-1.1Mn0-0.1NiO2)  
 884323-80-2, Iron lithium nickel oxide (Fe0-0.1Li0.9-1.1NiO2)  
 884323-81-3, Lithium magnesium nickel oxide (Li0.9-1.1Mg0-0.1NiO2)  
 884323-82-4, Lanthanum lithium nickel oxide (La0-0.1Li0.9-1.1NiO2)  
 884323-83-5, Cerium lithium nickel oxide (Ce0-0.1Li0.9-1.1NiO2)  
 884323-84-6, Lithium nickel strontium oxide (Li0.9-1.1NiSr0-0.1O2)  
 884323-85-7, Lithium nickel vanadium oxide (Li0.9-1.1NiV0-0.1O2)  
 884323-86-8, Aluminum cobalt lithium oxide (Al0-0.1CoLi0.9-1.1O2)  
 884323-87-9, Chromium cobalt lithium oxide (Cr0-0.1CoLi0.9-1.1O2)  
 884323-88-0, Cobalt lithium manganese oxide (CoLi0.9-1.1Mn0-0.1O2)  
 884323-89-1, Cobalt iron lithium oxide (CoFe0-0.1Li0.9-1.1O2)  
 884323-90-4, Cobalt lithium magnesium oxide (CoLi0.9-1.1Mg0-0.1O2)  
 884323-91-5, Cobalt lanthanum lithium oxide (CoLa0-0.1Li0.9-1.1O2)  
 884323-92-6, Cerium cobalt lithium oxide (Ce0-0.1CoLi0.9-1.1O2)  
 884323-93-7, Cobalt lithium strontium oxide (CoLi0.9-1.1Sr0-0.1O2)  
 884323-94-8, Cobalt lithium vanadium oxide (CoLi0.9-1.1V0-0.1O2)  
 884323-95-9, Aluminum lithium manganese oxide (Al0-0.1Li0.9-1.1MnO2)  
 884323-96-0, Chromium lithium manganese oxide (Cr0-0.1Li0.9-1.1MnO2)  
 884323-97-1, Lithium manganese oxide (Li0.9-1.1Mn1-1.1O2) 884324-00-9, Iron lithium manganese oxide (Fe0-0.1Li0.9-1.1MnO2) 884324-02-1, Lithium magnesium manganese oxide (Li0.9-1.1Mg0-0.1MnO2) 884324-05-4, Lanthanum lithium manganese oxide (La0-0.1Li0.9-1.1MnO2) 884324-08-7, Cerium lithium manganese oxide (Ce0-0.1Li0.9-1.1MnO2) 884324-11-2, Lithium manganese strontium oxide (Li0.9-1.1MnSr0-0.1O2) 884324-16-7, Lithium manganese vanadium oxide (Li0.9-1.1MnV0-0.1O2) 884324-19-0, Aluminum lithium manganese oxide (Al0-0.1Li0.9-1.1Mn2O4) 884324-21-4, Chromium lithium manganese oxide (Cr0-0.1Li0.9-1.1Mn2O4) 884324-23-6, Iron lithium manganese oxide (Fe0-0.1Li0.9-1.1Mn2O4) 884324-26-9, Lithium magnesium manganese oxide (Li0.9-1.1Mg0-0.1Mn2O4) 884324-28-1, Lanthanum lithium manganese oxide (La0-0.1Li0.9-1.1Mn2O4) 884324-30-5, Cerium lithium manganese oxide (Ce0-0.1Li0.9-1.1Mn2O4) 884324-31-6, Lithium manganese strontium oxide (Li0.9-1.1Mn2Sr0-0.1O4) 884324-32-7, Lithium manganese vanadium oxide (Li0.9-1.1Mn2V0-0.1O4)  
 RL: DEV (Device component use); USES (Uses)  
 (method of preparation of conductive agent-cathode active material composite for lithium secondary battery)

L3 ANSWER 15 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2006:399804 CAPLUS  
 DOCUMENT NUMBER: 145:106689  
 TITLE: Factors influencing the crystal chemistry of chemically delithiated layered HxNi1-y-zMnyCozO2  
 AUTHOR(S): Choi, J.; Manthiram, A.  
 CORPORATE SOURCE: Materials Science and Engineering Program, The University of Texas at Austin, Austin, TX, 78712, USA  
 SOURCE: Journal of Materials Chemistry (2006), 16(18), 1726-1733  
 CODEN: JMACEP; ISSN: 0959-9428

PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST delithiated cobalt hydrogen manganese nickel oxide cathode lithium  
battery; crystal chem delithiated layered cobalt manganese nickel  
oxide  
IT Battery cathodes  
(factors influencing the crystal chemical of chemical-delithiated layered  
HxNi1-y-zMnyCozO2 cathode material for lithium batteries)  
IT 12017-00-4D, Cobalt oxide (CoO2), hydrogenated 12190-79-3, Cobalt  
lithium oxide (CoLiO2) 101920-93-8, Cobalt lithium nickel oxide  
(Co0.5LiNi0.5O2) 128975-24-6, Lithium manganese nickel oxide  
(LiMn0.5Ni0.5O2) 216481-53-7D, Cobalt lithium nickel oxide  
(Co0.5Li0.2Ni0.5O2), hydrogenated 346417-97-8, Cobalt lithium manganese  
nickel oxide (Co0.33LiMn0.33Ni0.33O2) 390362-01-3, Cobalt lithium  
manganese nickel oxide (Co0.5LiMn0.25Ni0.25O2) 405890-05-3,  
Cobalt lithium manganese nickel oxide (Co0.1LiMn0.45Ni0.45O2)  
459408-76-5, Cobalt lithium manganese nickel oxide  
(Co0.05LiMn0.48Ni0.48O2) 484031-92-7D, Cobalt nickel oxide  
(Co0.5Ni0.5O2), hydrogenated 522613-35-0D, Manganese nickel oxide  
(MnNiO4), hydrogenated 697766-76-0, Cobalt lithium manganese  
nickel oxide (Co0.15LiMn0.42Ni0.42O2) 781672-38-6, Cobalt lithium  
manganese nickel oxide (Co0.58LiMn0.21Ni0.21O2) 854546-03-5, Cobalt  
lithium manganese nickel oxide (Co0.33LiMn0.34Ni0.34O2) 854546-04-6,  
Cobalt lithium manganese nickel oxide (Co0.41LiMn0.3Ni0.3O2)  
872998-55-5D, Cobalt manganese nickel oxide (Co0.5Mn0.25Ni0.25O2),  
hydrogenated 872998-56-6D, Cobalt manganese nickel oxide  
(Co0.41Mn0.3Ni0.3O2), hydrogenated 872998-57-7D, Cobalt manganese nickel  
oxide (Co0.15Mn0.42Ni0.42O2), hydrogenated 895529-68-7 895529-70-1  
895529-72-3, Lithium manganese nickel hydride oxide  
(Li0.08Mn0.5Ni0.5H0.34O2) 895529-74-5D, Cobalt manganese nickel oxide  
(Co0.33Mn0.34Ni0.34O2), hydrogenated  
RL: PRP (Properties); TEM (Technical or engineered material use); USES  
(Uses)  
(factors influencing the crystal chemical of chemical-delithiated layered  
HxNi1-y-zMnyCozO2 cathode material for lithium batteries)  
IT 13826-86-3, Nitronium fluoroborate (NO2BF4)  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PROC (Process)  
(in chemical delithiation of layered HxNi1-y-zMnyCozO2 cathode material  
for lithium batteries)

L3 ANSWER 16 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:378241 CAPLUS  
DOCUMENT NUMBER: 145:86412  
TITLE: Impact of cobalt substitution for manganese on the  
structural and electrochemical properties of  
LiNi0.5Mn0.5O2  
AUTHOR(S): Li, Decheng; Sasaki, Yuki; Kobayakawa, Koichi; Sato,  
Yuichi  
CORPORATE SOURCE: High-Tech Research Center, Kanagawa University, 1-1-40  
Suehiromachi, Tsurumi-ku, Yokohama, 230-0045, Japan  
SOURCE: Electrochimica Acta (2006), 51(18), 3809-3813  
CODEN: ELCAAV; ISSN: 0013-4686  
PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode lithium battery  
IT Battery cathodes  
(impact of cobalt substitution for manganese on structural and  
electrochem. properties of LiNi0.5Mn0.5O2 cathode material for lithium  
batteries)



IT Secondary batteries  
 (lithium; impact of cobalt substitution for manganese on structural and electrochem. properties of  $\text{LiNi}_{0.5}\text{Mn}_{0.5}\text{O}_2$  cathode material for lithium batteries)

IT 101920-93-8, Cobalt lithium nickel oxide ( $\text{Co}_{0.5}\text{LiNi}_{0.5}\text{O}_2$ ) 128975-24-6, Lithium manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 176206-89-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.2}\text{Ni}_{0.5}\text{O}_2$ ) 191024-83-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.1}\text{Ni}_{0.5}\text{O}_2$ ) 193215-53-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.3}\text{Ni}_{0.5}\text{O}_2$ ) 193215-92-8, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.4}\text{Ni}_{0.5}\text{O}_2$ )  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (impact of cobalt substitution for manganese on structural and electrochem. properties of  $\text{LiNi}_{0.5}\text{Mn}_{0.5}\text{O}_2$  cathode material for lithium batteries)

L3 ANSWER 17 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2006:367258 CAPLUS  
 DOCUMENT NUMBER: 144:373158  
 TITLE: Nonaqueous electrolyte secondary battery  
 INVENTOR(S): Deguchi, Masaki; Matsui, Tooru; Yoshizawa, Hiroshi  
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
 SOURCE: U.S. Pat. Appl. Publ., 8 pp., Cont.-in-part of Appl. No. PCT/JP05/004655.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006083988	A1	20060420	US 2005-287446	20051128
WO 2005099022	A1	20051020	WO 2005-JP4655	20050316

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: JP 2004-113208 A 20040407  
 WO 2005-JP4655 A2 20050316

TI Nonaqueous electrolyte secondary battery

AB A non-aqueous electrolyte secondary battery includes: a pos. electrode capable of absorbing and desorbing lithium; a neg. electrode capable of absorbing and desorbing lithium; a separator interposed between the pos. electrode and the neg. electrode; and a non-aqueous electrolyte. The pos. electrode includes a composite oxide represented by:  $\text{LiNi}_x\text{M}_{1-x}\text{LyO}_2$  as an active material. The formula satisfies  $0.3 \leq x \leq 0.9$  and  $0 \leq y \leq 0.1$ . The element M is at least one selected from the group consisting of Co and Mn, and the element L is at least one selected from the group consisting of Mg, Al, Ti, Sr, Zn, B, Ca, Cr, Si, Ga, Sn, P, V, Sb, Nb, Ta, Mo, W, Zr, Y and Fe. The non-aqueous electrolyte includes a main solvent, a solute and vinyl ethylene carbonate.

ST battery secondary nonaq electrolyte

IT Battery cathodes  
 Battery electrolytes  
 Secondary batteries  
 (nonaq. electrolyte secondary battery)

IT 882214-40-6, Cobalt lithium nickel oxide ( $\text{Co}_{0.15}\text{LiNi}_{0.84}\text{O}_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (Al-doped; nonaq. electrolyte secondary battery)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate  
 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 21324-40-3, Lithium hexafluorophosphate 101920-93-8, Cobalt lithium  
 nickel oxide (Co<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>) 113066-90-3, Cobalt lithium nickel oxide  
 (Co<sub>0.6</sub>LiNi<sub>0.4</sub>O<sub>2</sub>) 116327-68-5, Cobalt lithium nickel oxide  
 (Co<sub>0.3</sub>LiNi<sub>0.7</sub>O<sub>2</sub>) 116327-69-6, Cobalt lithium nickel oxide  
 (Co<sub>0.1</sub>LiNi<sub>0.9</sub>O<sub>2</sub>) 118557-81-6, Cobalt lithium nickel oxide  
 (Co<sub>0.7</sub>LiNi<sub>0.3</sub>O<sub>2</sub>) 128975-24-6, Lithium manganese nickel oxide  
 LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub> 143623-49-8, Cobalt lithium nickel oxide  
 (Co<sub>0.25</sub>LiNi<sub>0.75</sub>O<sub>2</sub>) 179186-41-5, Lithium manganese nickel oxide  
 (LiMn<sub>0.7</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 193214-24-3, Aluminum cobalt lithium nickel oxide  
 (Al<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 193215-92-8, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 195880-90-1, Cobalt lithium magnesium  
 nickel oxide (Co<sub>0.15</sub>LiMg<sub>0.05</sub>Ni<sub>0.8</sub>O<sub>2</sub>) 203005-76-9, Cobalt lithium nickel  
 borate oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>(BO<sub>3</sub>)<sub>0.05</sub>O<sub>1.85</sub>) 209908-08-7, Aluminum cobalt  
 lithium nickel oxide (Al<sub>0.03</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 216385-46-5, Cobalt  
 lithium nickel tin oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Sn<sub>0.05</sub>O<sub>2</sub>) 216385-49-8, Cobalt  
 lithium nickel oxide silicate (Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>1.8</sub>(SiO<sub>4</sub>)<sub>0.05</sub>) 216385-50-1,  
 Cobalt iron lithium nickel oxide (Co<sub>0.15</sub>Fe<sub>0.05</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 216385-51-2,  
 Cobalt lithium nickel titanium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Ti<sub>0.05</sub>O<sub>2</sub>)  
 346417-97-8, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 846020-48-2 849416-68-8, Cobalt lithium  
 nickel niobium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Nb<sub>0.05</sub>O<sub>2</sub>) 859529-03-6, Cobalt gallium  
 lithium nickel oxide (Co<sub>0.15</sub>Ga<sub>0.05</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-92-8, Cobalt lithium  
 nickel strontium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Sr<sub>0.05</sub>O<sub>2</sub>) 867248-93-9, Cobalt  
 lithium nickel zinc oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Zn<sub>0.05</sub>O<sub>2</sub>) 867248-94-0, Calcium  
 cobalt lithium nickel oxide (Ca<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-95-1,  
 Chromium cobalt lithium nickel oxide (Cr<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>)  
 867248-96-2, Cobalt lithium nickel oxide phosphate  
 (Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>1.8</sub>(PO<sub>4</sub>)<sub>0.05</sub>) 867248-97-3, Cobalt lithium nickel vanadium  
 oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>V<sub>0.05</sub>O<sub>2</sub>) 867248-98-4, Antimony cobalt lithium nickel  
 oxide (Sb<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-99-5, Cobalt lithium nickel  
 tantalum oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Ta<sub>0.05</sub>O<sub>2</sub>) 867249-00-1, Cobalt lithium  
 molybdenum nickel oxide (Co<sub>0.15</sub>LiMo<sub>0.05</sub>Ni<sub>0.8</sub>O<sub>2</sub>) 867249-01-2, Cobalt  
 lithium nickel zirconium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Zr<sub>0.05</sub>O<sub>2</sub>) 867249-02-3,  
 Cobalt lithium nickel yttrium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Y<sub>0.05</sub>O<sub>2</sub>) 867249-03-4  
 867249-04-5 867249-05-6 867249-06-7 882214-39-3, Aluminum cobalt  
 lithium nickel oxide (Al<sub>0.01</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 882214-41-7, Cobalt  
 lithium nickel tungsten oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>W<sub>0.05</sub>O<sub>2</sub>) 882214-42-8  
 882214-43-9 882214-44-0  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte secondary battery)

IT 872-36-6, Vinylene carbonate 4427-96-7, Vinyl ethylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte secondary battery)

L3 ANSWER 18 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:185086 CAPLUS  
 DOCUMENT NUMBER: 144:236271  
 TITLE: Method of preparation of cathode active material for  
 nonaqueous electrolyte secondary battery  
 INVENTOR(S): Nakai, Kenji; Kurihara, Katsutoshi; Koishikawa,  
 Yoshimasa; Hara, Kenji; Hirahata, Syouji  
 PATENT ASSIGNEE(S): Shin-Kobe Electric Machinery Co., Ltd., Japan  
 SOURCE: Eur. Pat. Appl., 23 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1630891	A1	20060301	EP 2005-18848	20050830
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK,				

BA, HR, IS, YU  
 JP 2006066330 A2 20060309 JP 2004-250031 20040830  
 US 2006046143 A1 20060302 US 2005-213876 20050830  
 CN 1744352 A 20060308 CN 2005-10093830 20050830  
 PRIORITY APPLN. INFO.: JP 2004-250031 A 20040830  
 REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Method of preparation of cathode active material for nonaqueous  
 electrolyte secondary battery  
 AB A non-aqueous electrolyte secondary battery that can restrict  
 lowering of battery performance during battery  
 preservation is provided. A neg. electrode mixture including graphite is  
 applied on a rolled copper foil and a pos. electrode mixture including  
 lithium manganate is applied on an aluminum foil are used. An oxide in  
 which one element selected from Al, Si, Ti, V, Cr, Fe, Ni, Cu, Zn, Zr, Mo,  
 W, Pb and dissimilar to elements constituting the lithium manganate is  
 oxidized is intermixed with the lithium manganate. An intermixt. amount of  
 the oxide is set such that a molar number of the dissimilar element contained  
 in one gram of the pos. electrode active material to a molar number of  
 lithium contained in one gram of the pos. electrode active material is not  
 more than 5/1000. Charge transfer is restricted by the oxide during  
 battery preservation.  
 ST cathode active material nonaq electrolyte secondary battery  
 IT Secondary batteries  
 (lithium; method of preparation of cathode active material for nonaq.  
 electrolyte secondary battery)  
 IT Transition metal oxides  
 RL: DEV (Device component use); USES (Uses)  
 (lithium; method of preparation of cathode active material for nonaq.  
 electrolyte secondary battery)  
 IT Battery cathodes  
 (method of preparation of cathode active material for nonaq. electrolyte  
 secondary battery)  
 IT 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium  
 oxide (CoLiO2) 39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt  
 lithium oxide 128975-24-6, Lithium manganese nickel oxide LiMn0.5Ni0.5O2  
 162684-16-4, Lithium manganese nickel oxide 182442-95-1, Cobalt lithium  
 manganese nickel oxide 193215-96-2, Cobalt lithium manganese  
 nickel oxide (Co0.2LiMn0.4Ni0.4O2)  
 RL: DEV (Device component use); USES (Uses)  
 (method of preparation of cathode active material for nonaq. electrolyte  
 secondary battery)  
 IT 1308-06-1, Cobalt oxide (Co3O4) 1308-38-9, Chromic oxide, uses  
 1309-37-1, Ferric oxide, uses 1309-60-0, Lead oxide (PbO2) 1313-99-1,  
 Nickel oxide, uses 1314-13-2, Zinc oxide, uses 1314-23-4, Zirconium  
 oxide, uses 1314-35-8, Tungsten oxide, uses 1317-38-0, Copper oxide  
 (CuO), uses 1332-37-2, Iron oxide, uses 1335-25-7, Lead oxide  
 1344-28-1, Aluminum oxide, uses 1344-70-3, Copper oxide 7631-86-9,  
 Silicon oxide, uses 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium  
 oxide 11118-57-3, Chromium oxide 12036-21-4, Vanadium dioxide  
 13463-67-7, Titanium oxide, uses 18868-43-4, Molybdenum oxide (MoO2)  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (method of preparation of cathode active material for nonaq. electrolyte  
 secondary battery)

L3 ANSWER 19 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2006:116858 CAPLUS  
 DOCUMENT NUMBER: 144:174334  
 TITLE: Manufacture of manganese based cathode active mass and  
 its usage  
 INVENTOR(S): Sun, Yucheng; Chen, Liquan; Huang, Xuejie  
 PATENT ASSIGNEE(S): Institute of Physics, Chinese Academy of Sciences,  
 Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 18 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent

LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1595689	A	20050316	CN 2003-156807	20030908
PRIORITY APPLN. INFO.:			CN 2003-156807	20030908

AB The cathode active mass, useful for secondary Li batteries, is a layer structured  $\text{LiMn}_{1-x-y}\text{Ni}_x\text{M}_y\text{O}_2$ , where M is Li, Mg, Co, Al, and Cr or a 1:(1-5) mol ratio mixture of 2 of the elements,  $0.2 \leq x \leq 0.8$ ,  $0 \leq y \leq 0.6$ , and  $(x+y) \leq 1$ ; and is manufactured by mixing a (1.0-4)M solution of soluble Mn and M salts with a (2.0-8.0)M alkaline solution and a (0.1-2.0)M in a reaction vessel, stirring the mixture, filtering, washing the precipitate and drying to obtain a Mn containing precursor; modifying the precursor with a soluble modifying salt and a complexing agent by a sol-gel process or by precipitation; wet mixing the modified precursor with a Li salt at a precursor/Li salt mol. ratio 1:(1.0-1.1), and mist spraying to form 1-100  $\mu\text{m}$  solid particles, and firing at 600-1100° for 1-48 h.

ST battery cathode layer structured lithium manganese nickel oxide  
manuf

IT Battery cathodes  
Sol-gel processing  
(method for manufacture of manganese pos. electrode material and its application)

IT 128975-24-6P, Lithium manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ )  
 170110-41-5P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.6}\text{LiMn}_{0.2}\text{Ni}_{0.2}\text{O}_2$ )  
 179802-95-0P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.1}\text{Ni}_{0.8}\text{O}_2$ )  
 193216-02-3P 217309-43-8P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.3}\text{Ni}_{0.4}\text{O}_2$ ) 848828-26-2P, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.05}\text{Mn}_{0.5}\text{Ni}_{0.45}\text{O}_2$ ) 874442-89-4P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.05}\text{LiMn}_{0.15}\text{Ni}_{0.8}\text{O}_2$ ) 874442-90-7P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.15}\text{LiMn}_{0.35}\text{Ni}_{0.5}\text{O}_2$ ) 874442-91-8P, Chromium lithium manganese nickel oxide ( $\text{Cr}_{0.05}\text{LiMn}_{0.15}\text{Ni}_{0.8}\text{O}_2$ ) 874442-92-9P, Chromium lithium manganese nickel oxide ( $\text{Cr}_{0.3}\text{LiMn}_{0.3}\text{Ni}_{0.4}\text{O}_2$ )  
 874442-93-0P, Lithium manganese nickel oxide ( $\text{Li}_{1.05}\text{Mn}_{0.15}\text{Ni}_{0.8}\text{O}_2$ )  
 874442-94-1P, Lithium manganese nickel oxide ( $\text{Li}_{1.15}\text{Mn}_{0.35}\text{Ni}_{0.5}\text{O}_2$ )  
 874442-95-2P, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.2}\text{Mn}_{0.5}\text{Ni}_{0.3}\text{O}_2$ ) 874442-96-3P, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.1}\text{Mn}_{0.5}\text{Ni}_{0.4}\text{O}_2$ ) 874442-97-4P 874442-98-5P 874442-99-6P  
 874443-00-2P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.05}\text{Li}_{1.1}\text{Mn}_{0.35}\text{Ni}_{0.5}\text{O}_2$ ) 874443-01-3P 874443-02-4P  
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
 (comps. and manufacture of layer structured substituted lithium manganese oxide cathode active mass for secondary lithium batteries)

IT 554-13-2, Lithium carbonate 1307-96-6, Cobalt oxide ( $\text{CoO}$ ), uses 1308-06-1, Cobalt oxide ( $\text{Co}_3\text{O}_4$ ) 1309-48-4, Magnesia, uses 1313-13-9, Manganese dioxide, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7784-30-7, Aluminum phosphate ( $\text{AlPO}_4$ ) 7789-24-4, Lithium fluoride, uses 10377-52-3, Trilithium phosphate 12057-17-9, Lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ) 12057-24-8, Lithium oxide, uses 12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 13463-67-7, Titania, uses 37220-89-6, Lithium aluminate 99489-75-5, Chromium lithium oxide ( $\text{Cr}_2\text{LiO}_4$ )  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (comps. and manufacture of layer structured substituted lithium manganese oxide cathode active mass for secondary lithium batteries)

IT 68-04-2, Trisodium citrate 77-92-9, Citric acid, uses 87-69-4, Tartaric acid, uses 302-01-2, Hydrazine, uses 1336-21-6, Ammonium hydroxide 6484-52-2, Ammonium nitrate, uses 7783-20-2, Ammonium sulfate, uses 12125-02-9, Ammonium chloride, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (comps. and manufacture of layer structured substituted lithium manganese oxide cathode active mass for secondary lithium batteries)

ACCESSION NUMBER: 2006:116823 CAPLUS  
 DOCUMENT NUMBER: 144:174327  
 TITLE: Manufacture of cathode material for secondary lithium battery  
 INVENTOR(S): Wu, Mengtao; Chen, Botao; Huang, Laihe; Xu, Ning; Zhang, Ning  
 PATENT ASSIGNEE(S): Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 7 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1595680	A	20050316	CN 2004-10019741	20040625
PRIORITY APPLN. INFO.:			CN 2004-10019741	20040625
TI	Manufacture of cathode material for secondary lithium battery			
ST	secondary battery cathode manuf lithium nickel manganese composite oxide			
IT	Battery cathodes (manufacture of cathodes containing lithium manganese nickel composite oxides for secondary lithium batteries)			
IT	193215-96-2P, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.4</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) 193216-02-3P 346417-97-8P, Cobalt lithium manganese nickel oxide (Co <sub>0.33</sub> LiMn <sub>0.33</sub> Ni <sub>0.33</sub> O <sub>2</sub> ) RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (manufacture of cathodes containing lithium manganese nickel composite oxides for secondary lithium batteries)			
IT	554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide (Li(OH)) 602297-52-9, Cobalt manganese nickel hydroxide (Co <sub>0.33</sub> Mn <sub>0.33</sub> Ni <sub>0.33</sub> (OH) <sub>2</sub> ) 602297-53-0, Cobalt manganese nickel hydroxide (Co <sub>0.2</sub> Mn <sub>0.4</sub> Ni <sub>0.4</sub> (OH) <sub>2</sub> ) 874753-63-6 RL: RCT (Reactant); RACT (Reactant or reagent) (manufacture of cathodes containing lithium manganese nickel composite oxides for secondary lithium batteries)			

L3 ANSWER 21 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:90687 CAPLUS  
 DOCUMENT NUMBER: 144:353653  
 TITLE: Layered Li<sub>1+x</sub>(Ni<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.15</sub>)<sub>1-x</sub>O<sub>2</sub> Positive Electrode Materials for Lithium-Ion Batteries  
 AUTHOR(S): Tran, N.; Croguennec, L.; Labrugere, C.; Jordy, C.; Biensan, Ph.; Delmas, C.  
 CORPORATE SOURCE: Institut de Chimie de la Matiere Condensee de Bordeaux, CNRS and Ecole Nationale Supérieure de Chimie et Physique de Bordeaux, Université Bordeaux I, Pessac, 33608, Fr.  
 SOURCE: Journal of the Electrochemical Society (2006), 153(2), A261-A269  
 CODEN: JESOAN; ISSN: 0013-4651  
 PUBLISHER: Electrochemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Layered Li<sub>1+x</sub>(Ni<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.15</sub>)<sub>1-x</sub>O<sub>2</sub> Positive Electrode Materials for Lithium-Ion Batteries  
 ST layered cobalt lithium manganese nickel oxide cathode battery  
 IT Battery cathodes  
 (layered Li<sub>1+x</sub>(Ni<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.15</sub>)<sub>1-x</sub>O<sub>2</sub> cathode material for lithium-ion batteries)  
 IT Materials  
 (layered; layered Li<sub>1+x</sub>(Ni<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.15</sub>)<sub>1-x</sub>O<sub>2</sub> cathode material for

lithium-ion batteries)

IT Secondary batteries  
(lithium; layered  $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$  cathode material for lithium-ion batteries)

IT 697766-76-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.15}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 854736-23-5, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.13}\text{Li}_{1.12}\text{Mn}_{0.37}\text{Ni}_{0.37}\text{O}_2$ ) 881376-10-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.15}\text{Li}_{1.03}\text{Mn}_{0.41}\text{Ni}_{0.41}\text{O}_2$ ) 881376-11-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.14}\text{Li}_{1.1}\text{Mn}_{0.38}\text{Ni}_{0.38}\text{O}_2$ ) 881376-12-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.12}\text{Li}_{1.2}\text{Mn}_{0.34}\text{Ni}_{0.34}\text{O}_2$ ) 881376-13-2, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.11}\text{Li}_{1.25}\text{Mn}_{0.32}\text{Ni}_{0.32}\text{O}_2$ ) 881376-14-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{Li}_{1.33}\text{Mn}_{0.28}\text{Ni}_{0.28}\text{O}_2$ ) 881376-15-4, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.14}\text{Li}_{1.08}\text{Mn}_{0.39}\text{Ni}_{0.39}\text{O}_2$ ) 881376-16-5, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.15}\text{Li}_{0.5}\text{Mn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 881376-17-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.15}\text{Li}_{0.4}\text{Mn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 881376-18-7, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.15}\text{Li}_{0.34}\text{Mn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 881376-19-8, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.13}\text{Li}_{0.73}\text{Mn}_{0.37}\text{Ni}_{0.37}\text{O}_2$ ) 881376-20-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.13}\text{Li}_{0.66}\text{Mn}_{0.37}\text{Ni}_{0.37}\text{O}_2$ ) 881376-21-2, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.13}\text{Li}_{0.42}\text{Mn}_{0.37}\text{Ni}_{0.37}\text{O}_2$ ) 881376-22-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.13}\text{Li}_{0.75}\text{Mn}_{0.37}\text{Ni}_{0.37}\text{O}_2$ )

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(layered  $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$  cathode material for lithium-ion batteries)

L3 ANSWER 22 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1354489 CAPLUS

DOCUMENT NUMBER: 144:91105

TITLE: Cathode active mass powder for secondary lithium battery

INVENTOR(S): Mihara, Takuya; Wakasugi, Yukimitsu; Saito, Naoshi; Suhara, Manabu

PATENT ASSIGNEE(S): Seimi Chemical Co., Ltd., Japan

SOURCE: PCT Int. Appl., 30 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005124898	A1	20051229	WO 2005-JP10819	20050613
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

PRIORITY APPLN. INFO.: JP 2004-177884 A 20040616  
JP 2004-206551 A 20040713

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Cathode active mass powder for secondary lithium battery

ST secondary lithium battery cathode lithium transition metal oxide

IT Battery cathodes  
(cathodes containing mixts. of different kinds of lithium transition metal composite oxides for secondary lithium batteries)

IT 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 52627-24-4, Cobalt lithium oxide 479258-19-0, Lithium manganese nickel oxide (Li<sub>1.05</sub>Mn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 500912-67-4, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>Li<sub>1.05</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 872123-89-2, Cobalt lithium manganese nickel oxide (Co<sub>0.14</sub>Li<sub>1.05</sub>Mn<sub>0.43</sub>Ni<sub>0.43</sub>O<sub>2</sub>) 872123-90-5, Aluminum lithium manganese oxide (Al<sub>0.03</sub>Li<sub>1.03</sub>Mn<sub>1.97</sub>O<sub>4</sub>)  
RL: DEV (Device component use); USES (Uses)  
(cathodes containing mixts. of different kinds of lithium transition metal composite oxides for secondary lithium batteries)

L3 ANSWER 23 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1305884 CAPLUS

DOCUMENT NUMBER: 144:54376

TITLE: Cathode active mass for secondary nonaqueous lithium battery, its manufacture, and the battery using the active mass

INVENTOR(S): Kurita, Fumi; Nakajima, Motoe

PATENT ASSIGNEE(S): Hitachi Metals, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005346956	A2	20051215	JP 2004-162152	20040531
PRIORITY APPLN. INFO.:			JP 2004-162152	20040531

TI Cathode active mass for secondary nonaqueous lithium battery, its manufacture, and the battery using the active mass

AB The active mass comprise a Li-transition metal composite oxide; where the surface of the composite oxide is modified by a metal compound The active mass is manufactured by adding the metal compound to the composite oxide during cracking the composite oxide and heat treating. The battery has the above cathode active mass.

ST secondary lithium battery cathode lithium transition metal oxide; battery cathode metal compd modification

IT Battery cathodes  
(cathodes containing metal compds. modified on lithium transition metal composite oxides for secondary lithium batteries)

IT Secondary batteries  
(lithium; cathodes containing metal compds. modified on lithium transition metal composite oxides for secondary lithium batteries)

IT 193215-50-8P, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-96-2P, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 871466-01-2P 871466-02-3P, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>Li<sub>1.1</sub>Mn<sub>0.25</sub>Ni<sub>0.45</sub>O<sub>2</sub>)

RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(cathodes containing metal compds. modified on lithium transition metal composite oxides for secondary lithium batteries)

IT 557-04-0, Magnesium stearate 637-12-7, Aluminum stearate

RL: MOA (Modifier or additive use); USES (Uses)

(cathodes containing metal compds. modified on lithium transition metal composite oxides for secondary lithium batteries)

L3 ANSWER 24 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1291965 CAPLUS

DOCUMENT NUMBER: 144:24920

TITLE: Lithium secondary battery with high power

INVENTOR(S): Park, Hey Woong; Yu, Ji-Sang; Kim, Sung-Woo; Kim, Min Su

PATENT ASSIGNEE(S): S. Korea

SOURCE: U.S. Pat. Appl. Publ., 12 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005271943	A1	20051208	US 2005-91072	20050328
WO 2006004279	A1	20060112	WO 2005-KR909	20050329
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				

PRIORITY APPLN. INFO.: KR 2004-21205 A 20040329

TI Lithium secondary battery with high power

AB The present invention provides a nonaq. electrolyte-based high power lithium secondary battery having a long-term service life and superior safety at both room temperature and high temperature, even after repeated high-current charging and discharging, wherein the battery comprises a mixture of a particular lithium manganese-metal composite oxide having a spinel structure and a particular lithium nickel-manganese-cobalt composite oxide having a layered structure, as a cathode active material.

ST lithium secondary battery high power; safety lithium secondary battery high power

IT Secondary batteries  
 (lithium; nonaq. electrolyte-based lithium secondary battery with high power and superior safety)

IT Battery cathodes  
 Safety  
 (nonaq. electrolyte-based lithium secondary battery with high power and superior safety)

IT Carbon black, uses  
 Fluoropolymers, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte-based lithium secondary battery with high power and superior safety)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate 7439-93-2, Lithium, uses 9002-88-4, Polyethylene 21324-40-3, Lithium hexafluorophosphate 193215-96-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 220025-87-6, Aluminum lithium manganese oxide (Al<sub>0.05</sub>Li<sub>1.1</sub>Mn<sub>1.85</sub>O<sub>4</sub>) 220025-92-3, Lithium magnesium manganese oxide (Li<sub>1.1</sub>Mg<sub>0.05</sub>Mn<sub>1.85</sub>O<sub>4</sub>) 305365-08-6, Aluminum lithium manganese oxide (Al<sub>0.05</sub>Li<sub>1.08</sub>Mn<sub>1.87</sub>O<sub>4</sub>) 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte-based lithium secondary battery with high power and superior safety)

IT 24937-79-9, PVDF  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte-based lithium secondary battery with high power and superior safety)

L3 ANSWER 25 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1282618 CAPLUS

DOCUMENT NUMBER: 144:38299

TITLE: Nickel manganese cobalt oxide, its manufacture, layer structured lithium nickel manganese cobalt oxide, its manufacture cathode active mass for secondary lithium battery, the cathode, and the battery



INVENTOR(S): Shizuka, Kenji  
 PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 25 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2005336004	A2	20051208	JP 2004-156358	20040526
PRIORITY APPLN. INFO.:				JP 2004-156358	20040526
TI	Nickel manganese cobalt oxide, its manufacture, layer structured lithium nickel manganese cobalt oxide, its manufacture cathode active mass for secondary lithium battery, the cathode, and the battery				
AB	The Ni Mg Co oxide, a precursor oxide, is $(\text{Co}_{1-2x}\text{Ni}_x\text{Mn}_x)_3\text{O}_4$ , where $x = 0.3-0.5$ and is prepared by firing a mixture of Ni, Mn, and Co sources between $[(2500/3)x + 400]^\circ$ and $[(7000/3)x - 50]^\circ$ in an O atmospheric The layer structured Li containing oxide is secondary particles of agglomerated primary $\text{Co}_{1-2x}\text{Li}_{1+y}\text{Ni}_x\text{Mn}_x\text{O}_2$ ( $y \leq 0.2$ ) particles having average diameter standard deviation $\leq 0.15$ ; and is manufactured by firing a mixture of the precursor oxide and a Li compound between lower temperature and $1100^\circ$ , where the lower temperature is the higher one of $800^\circ$ and $(3000x-450)^\circ$ . The layer structured Li containing oxide is used as the cathode active mass, and the secondary Li battery using cathodes containing the active mass.				
ST	secondary lithium battery cathode cobalt manganese nickel oxide precursor; lithium cobalt manganese nickel oxide manuf battery cathode; particle size lithium cobalt manganese nickel oxide battery cathode				
IT	Battery cathodes (compsns. and manufacture of precursor oxides and layer structure lithium oxides for secondary lithium battery cathodes)				
IT	247565-42-0P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.05}\text{Mn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) 477567-62-7P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{Li}_{1.05}\text{Mn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 500912-67-4P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{1.05}\text{Mn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (compsns. and manufacture of layer structure cobalt lithium manganese nickel oxides for secondary lithium battery cathodes)				
IT	99627-76-6P, Cobalt manganese nickel oxide ( $\text{CoMnNiO}_4$ ) 870827-49-9P, Cobalt manganese nickel oxide ( $\text{Co}_{0.6}\text{Mn}_{1.2}\text{Ni}_{1.2}\text{O}_4$ ) 870827-51-3P, Cobalt manganese nickel oxide ( $\text{Co}_{0.3}\text{Mn}_{1.35}\text{Ni}_{1.35}\text{O}_4$ ) RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (compsns. and manufacture of precursor oxides for cathode active mass for secondary lithium batteries)				

L3 ANSWER 26 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1281192 CAPLUS

DOCUMENT NUMBER: 145:52336

TITLE: Synthesis and characterization of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode for lithium ion batteries

AUTHOR(S): Guo, Hua-jun; Zhang, Ming; Li, Xin-hai; Zhang, Xin-ming; Wang, Zhi-xing; Peng, Wen-jie; Hu, Min

CORPORATE SOURCE: School of Metallurgical Science and Engineering, Central South University, Changsha, 410083, Peop. Rep. China

SOURCE: Transactions of Nonferrous Metals Society of China (2005), 15(5), 1185-1189  
 CODEN: TNMCEW; ISSN: 1003-6326

PUBLISHER: Science Press

DOCUMENT TYPE: Journal

LANGUAGE: English  
 REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

- TI Synthesis and characterization of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode for lithium ion batteries
- AB  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  was prepared from  $\text{Li}_2\text{CO}_3$  and a triple oxide of Ni, Co and Mn at  $950^\circ$  in air. The structure and characteristics of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  were determined by XRD, SEM and electrochem. measurements. The compound  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  has layered structure with hexagonal lattice. The individual particles are agglomeration of many little primary particles whose size ranges from 100 nm to 200 nm. The  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode has excellent electrochem. performances with large reversible specific capacity of 142.5 mA h/g between 4.25 V, and good capacity retention of 83.20% after 450 charge/discharge cycles. Capacity of the battery increases with enhancement of charge voltage limit, and a specific discharge capacity of 175.2 mA h/g was obtained when the charge voltage limit is fixed at 4.45 V.
- ST synthesis lithium nickel cobalt manganese oxide cathode lithium battery
- IT Secondary batteries  
 (lithium; synthesis and characterization of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode for lithium ion batteries)
- IT Battery electrodes  
 Surface structure  
 X-ray diffraction  
 (synthesis and characterization of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode for lithium ion batteries)
- IT 405890-05-3P, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ )  
 RL: DEV (Device component use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)  
 (synthesis and characterization of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode for lithium ion batteries)
- IT 554-13-2, Lithium carbonate 37348-84-8, Cobalt manganese nickel oxide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (synthesis and characterization of  $\text{LiNi}_{0.45}\text{Co}_{0.10}\text{Mn}_{0.45}\text{O}_2$  cathode for lithium ion batteries)

L3 ANSWER 27 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:1242925 CAPLUS  
 DOCUMENT NUMBER: 143:480426  
 TITLE: Energy storage device and energy storage device module for use in an electric car  
 INVENTOR(S): Kumashiro, Yoshiaki; Arai, Juichi; Kobayasi, Mituru  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 16 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005260497	A1	20051124	US 2005-59350	20050217
JP 2005332655	A2	20051202	JP 2004-148854	20040519
PRIORITY APPLN. INFO.:			JP 2004-148854	A 20040519
IT Secondary batteries (lithium; energy storage device and energy storage device module for use in elec. car)				
IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 607706-67-2, Cobalt lithium manganese nickel oxide ((Co,Mn,Ni)LiO2) RL: DEV (Device component use); USES (Uses) (energy storage device and energy storage device module for use in elec. car)				

ACCESSION NUMBER: 2005:1239152 CAPLUS  
 DOCUMENT NUMBER: 144:8986  
 TITLE: Production of lithium compound oxides having layered crystal structure as cathodes for secondary lithium batteries  
 INVENTOR(S): Hara, Kenji; Hirahata, Shoji; Suzuki, Katsunori  
 PATENT ASSIGNEE(S): Shin-Kobe Electric Machinery Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005327644	A2	20051124	JP 2004-145784	20040517
PRIORITY APPLN. INFO.:			JP 2004-145784	20040517
TI	Production of lithium compound oxides having layered crystal structure as cathodes for secondary lithium batteries			
AB	The lithium compound oxides are expressed by $\text{LiNi}_a\text{Mn}_b\text{Co}_c\text{Mg}_d\text{O}_2$ ( $a > b \geq c$ , $d = 0.001-0.02$ , as mol. ratio). The compound oxides are produced by a process comprising steps of (1) producing solvents at least containing (dissolved) Ni compds., Mn compds., Co compds., and Mg compds., (2) copptg. at least Ni, Mn, Co, and Mg, and adding Li compds. to give compound oxide precursors, and (3) firing the precursors. The compds. of each metals may be selected from oxides, hydroxides, nitrates, sulfates, and/or carbonates. Secondary lithium batteries employing the cathodes are also claimed. The cathodes show uniform crystal structure and the batteries provide high output power even at low temperature environment.			
ST	battery cathode lithium compd oxide manuf; nickel lithium manganese cobalt magnesium oxide battery cathode; copptn manuf lithium compd oxide battery cathode			
IT	Secondary batteries (lithium; production of lithium compound oxides having layered crystal structure as secondary lithium battery cathodes)			
IT	Carbonates, processes Hydroxides (inorganic) Nitrates, processes Oxides (inorganic), processes Sulfates, processes RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process) (of metals; in production of lithium compound oxides having layered crystal structure as secondary lithium battery cathodes)			
IT	Battery cathodes Coprecipitation (production of lithium compound oxides having layered crystal structure as secondary lithium battery cathodes)			
IT	856700-33-9P; Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.34}\text{O}_2$ ) 870011-39-5P 870011-40-8P 870011-41-9P 870011-42-0P 870011-75-9P RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (cathodes; production of lithium compound oxides having layered crystal structure as secondary lithium battery cathodes)			
IT	554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide 7487-88-9, Magnesium sulfate, processes 7785-87-7, Manganese sulfate 7786-81-4, Nickel sulfate 10124-43-3, Cobalt sulfate RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process) (in production of lithium compound oxides having layered crystal structure as secondary lithium battery cathodes)			

ACCESSION NUMBER: 2005:1226940 CAPLUS  
 TITLE: Origin of the irreversible plateau (4.5V) of  
 Li[Li<sub>0.182</sub>Ni<sub>0.182</sub>Co<sub>0.091</sub>Mn<sub>0.545</sub>]O<sub>2</sub> layered material  
 AUTHOR(S): Gan, Chaolun; Zhan, Hui; Hu, Xiaohong; Zhou, Yunhong  
 CORPORATE SOURCE: Department of Chemistry, Wuhan University, Hubei,  
 Wuhan, 430072, Peop. Rep. China  
 SOURCE: Electrochemistry Communications (2005), 7(12),  
 1318-1322  
 CODEN: ECCMF9; ISSN: 1388-2481  
 PUBLISHER: Elsevier B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode irreversible plateau  
 battery  
 IT INDEXING IN PROGRESS  
 IT INDEXING IN PROGRESS  
 IT Secondary batteries  
 (lithium; origin of irreversible plateau at 4.5 V of  
 Li[Li<sub>0.182</sub>Ni<sub>0.182</sub>Co<sub>0.091</sub>Mn<sub>0.545</sub>]O<sub>2</sub> layered cathode material for lithium  
 batteries)  
 IT Battery cathodes  
 (origin of irreversible plateau at 4.5 V of  
 Li[Li<sub>0.182</sub>Ni<sub>0.182</sub>Co<sub>0.091</sub>Mn<sub>0.545</sub>]O<sub>2</sub> layered cathode material for lithium  
 batteries)  
 IT 193215-96-2, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 388587-53-9, Lithium manganese oxide  
 (Li<sub>1.33</sub>Mn<sub>0.67</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (origin of irreversible plateau at 4.5 V of  
 Li[Li<sub>0.182</sub>Ni<sub>0.182</sub>Co<sub>0.091</sub>Mn<sub>0.545</sub>]O<sub>2</sub> layered cathode material for lithium  
 batteries)

L3 ANSWER 30 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1198712 CAPLUS  
 DOCUMENT NUMBER: 143:443610  
 TITLE: Energy storage devices and energy storage device  
 modules  
 INVENTOR(S): Kumashiro, Yoshiaki; Arai, Juichi; Kobayasi, Mituru  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 15 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005250014	A1	20051110	US 2005-60478	20050218
JP 2005322420	A2	20051117	JP 2004-136973	20040506
CN 1694297	A	20051109	CN 2005-10004381	20050120
PRIORITY APPLN. INFO.:			JP 2004-136973	A 20040506

ST energy storage device module; lithium battery  
 IT Secondary batteries  
 (lithium; energy storage devices and energy storage device modules)  
 IT 7440-44-0, Carbon, uses 346417-97-8, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 607706-67-2, Cobalt lithium  
 manganese nickel oxide ((Co,Mn,Ni)LiO<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (energy storage devices and energy storage device modules)

L3 ANSWER 31 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1174996 CAPLUS  
 DOCUMENT NUMBER: 143:443512

TITLE: Lithium mixed oxide cathode active materials for nonaqueous secondary lithium batteries, method for their manufacture, and nonaqueous secondary lithium batteries

INVENTOR(S): Inada, Fumi; Nakajima, Motoe

PATENT ASSIGNEE(S): Hitachi Metals, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2005310744	A2	20051104	JP 2004-376870	20041227
PRIORITY APPLN. INFO.:				JP 2004-86962	A 20040324
TI	Lithium mixed oxide cathode active materials for nonaqueous secondary lithium batteries, method for their manufacture, and nonaqueous secondary lithium batteries				
AB	The cathode active materials consist of Li transition metal mixed oxide particles having their surfaces modified with 10-70 nm-thick metal compound layers containing $\geq 1$ of Al, Mg, Sn, Ti, Zn, and Zr. The oxide particles may have composition formula $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{MzO}_2$ ( $\text{M} = \text{Co}$ and/or $\text{Al}$ ; $a = 1-1.2$ ; $x = 0-0.65$ ; $y = 0.35-1$ ; $z = 0-0.65$ ; $x + y + z = 1$ ) and layer crystal structure. Method for manufacture of the active materials includes preparation of Li transition metal mixed oxide, followed by its surface modification by mixing the oxide with a solvent containing metal compds. and its treatment by irradiation with ultrasonic wave. Further specified conditions for the manufacturing processes, including granulation and heat treatment are also given. Nonaq. Li secondary batteries with cathodes comprising the claimed cathode active materials are also claimed. Batteries showing high power output are obtained.				
ST	lithium transition metal mixed oxide battery cathode; metal coated lithium mixed oxide battery cathode; nonaq secondary lithium battery mixed oxide cathode				
IT	Sol-gel processing (coating; formation of metal compound coatings on lithium transition metal mixed oxide cathode active materials for nonaq. secondary lithium batteries)				
IT	Battery cathodes (formation of metal compound coatings on lithium transition metal mixed oxide cathode active materials for nonaq. secondary lithium batteries)				
IT	Coating process (sol-gel; formation of metal compound coatings on lithium transition metal mixed oxide cathode active materials for nonaq. secondary lithium batteries)				
IT	193215-96-2P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) 247565-43-1P, Lithium manganese nickel oxide ( $\text{Li}_{1.05}\text{Mn}_{0.3}\text{Ni}_{0.7}\text{O}_2$ ) 868657-81-2P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.31}\text{Li}_{1.1}\text{Mn}_{0.31}\text{Ni}_{0.38}\text{O}_2$ ) 868657-82-3P RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses) (formation of metal compound coatings on lithium transition metal mixed oxide cathode active materials for nonaq. secondary lithium batteries)				
IT	2414-98-4, Magnesium diethoxide 3087-36-3, Titanium tetraethoxide 3173-69-1, Tin tetraethoxide 4073-85-2, Aluminum tripropoxide 13963-57-0 14024-63-6 23519-77-9, Zirconium tetrapropoxide RL: RCT (Reactant); RACT (Reactant or reagent) (metal compound coatings from; formation of metal compound coatings on lithium transition metal mixed oxide cathode active materials for nonaq. secondary lithium batteries)				

IT 64-17-5, Ethanol, uses 67-63-0, 2-Propanol, uses 7732-18-5, Water,  
uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(solvent; formation of metal compound coatings on lithium transition  
metal mixed oxide cathode active materials for nonaq. secondary lithium  
batteries)

L3 ANSWER 32 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1171090 CAPLUS

DOCUMENT NUMBER: 143:443499

TITLE: Layered lithium nickel manganese cobalt composite  
oxide powder for secondary lithium battery  
cathode material, its manufacture, cathode for the  
battery, and the battery

INVENTOR(S): Shizuka, Kenji; Okahara, Kenji

PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan

SOURCE: PCT Int. Appl., 42 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005104274	A1	20051103	WO 2005-JP8047	20050427
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
JP 2005340186	A2	20051208	JP 2005-128153	20050426
PRIORITY APPLN. INFO.:			JP 2004-131599	A 20040427

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Layered lithium nickel manganese cobalt composite oxide powder for  
secondary lithium battery cathode material, its manufacture,  
cathode for the battery, and the battery

AB The title oxide powder has a composition represented by:  $\text{Li}_{1+z}\text{Ni}_x\text{Mn}_y\text{Co}_{1-x-y}\text{O}_8$  ( $0 < z \leq 0.91$ ;  $x = 0.1-0.55$ ;  $y = 0.20-0.90$ ;  $x+y = 0.5-1$ ; and  $\delta = 1.9-3$ ), a volume resistivity material of  $\leq 5 \times 10^5$   
 $\Omega \cdot \text{cm}$ . at compaction under a pressure of 40 MPa, and a ratio  
of C content (weight%) to BET sp. surface area ( $\text{m}^2/\text{g}$ )  $\leq 0.025$ ; and is  
manufactured by preparing an evenly dispersed slurry by pulverizing a Ni compound, a  
Mn compound and a Co compound in a liquid medium to have average particle size  
 $\leq 0.3 \mu\text{m}$ ; spray drying the slurry, coagulating primary particles  
to form secondary particles as powder; completely mixing the obtained  
powder with a Li compound; firing the mixture in an O-containing gas atmosphere The  
cathode has a cathode active mass layer, containing the above composite oxide  
powder, on a collector. The battery has a Li-intercalating  
anode, a nonaq. electrolyte containing a Li salt, and the above cathode.

ST secondary battery cathode lithium nickel cobalt manganese oxide  
manuf

IT Battery cathodes  
(comps., characteristics and manufacture of lithium nickel manganese cobalt  
composite oxides for secondary lithium batteries)

IT Secondary batteries  
(lithium; comps., characteristics and manufacture of lithium nickel  
manganese cobalt composite oxides for secondary lithium  
batteries)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 623-53-0,  
Ethyl methyl carbonate 7782-42-5, Graphite, uses 21324-40-3, Lithium  
hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(comps., characteristics and manufacture of lithium nickel manganese cobalt  
composite oxides for secondary lithium batteries)

IT 807654-92-8P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>Li<sub>1.06</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 868658-11-1P, Cobalt lithium manganese nickel  
oxide (Co<sub>0.34</sub>Li<sub>1.09</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(comps., characteristics and manufacture of lithium nickel manganese cobalt  
composite oxides for secondary lithium batteries)

IT 1310-65-2, Lithium hydroxide 1317-35-7, Manganese oxide (Mn<sub>3</sub>O<sub>4</sub>)  
12054-48-7, Nickel hydroxide (Ni(OH)<sub>2</sub>) 21041-93-0, Cobalt hydroxide  
(Co(OH)<sub>2</sub>)  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(comps., characteristics and manufacture of lithium nickel manganese cobalt  
composite oxides for secondary lithium batteries)

L3 ANSWER 33 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1130978 CAPLUS  
DOCUMENT NUMBER: 143:408199  
TITLE: Secondary nonaqueous electrolyte battery  
INVENTOR(S): Deguchi, Masaki; Matsui, Tooru; Yoshizawa, Hiroshi  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: PCT Int. Appl., 20 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005099022	A1	20051020	WO 2005-JP4655	20050316
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CN 1806362	A	20060719	CN 2005-80000503	20050316
US 2006083988	A1	20060420	US 2005-287446	20051128
PRIORITY APPLN. INFO.:			JP 2004-113208	A 20040407
			WO 2005-JP4655	A2 20050316

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Secondary nonaqueous electrolyte battery

AB The battery comprises a separator between a Li-intercalating cathode and a Li-intercalating anode and a nonaq. electrolyte solution; where the cathode contains. The pos. electrode contains a composite oxide: Li<sub>x</sub>Ni<sub>1-x</sub>M<sub>1-x</sub>LyO<sub>2</sub> (x = 0.3-0.9; y = 0-0.1; M = Co and/or Mn; and L = Mg, Al, Ti, Sr, Zn, B, Ca, Cr, Si, Ga, Sn, P, V, Sb, Nb, Ta, Mo, W, Zr, Y, and/or Fe) as an active mass; and the electrolyte solution contains a main solvent, an electrolyte salt, and vinyl ethylene carbonate.

ST secondary battery cathode lithium nickel composite oxide;  
battery electrolyte vinyl ethylene carbonate

IT Battery cathodes  
Battery electrolytes  
(cathode containing lithium nickel composite oxides and electrolytes containing

vinyl ethylene carbonate for secondary lithium batteries)

IT Secondary batteries  
(lithium; cathode containing lithium nickel composite oxides and electrolytes containing vinyl ethylene carbonate for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 21324-40-3, Lithium hexafluorophosphate 101920-93-8, Cobalt lithium nickel oxide (Co<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>) 113066-90-3, Cobalt lithium nickel oxide (Co<sub>0.6</sub>LiNi<sub>0.4</sub>O<sub>2</sub>) 116327-68-5, Cobalt lithium nickel oxide (Co<sub>0.3</sub>LiNi<sub>0.7</sub>O<sub>2</sub>) 116327-69-6, Cobalt lithium nickel oxide (Co<sub>0.1</sub>LiNi<sub>0.9</sub>O<sub>2</sub>) 118557-81-6, Cobalt lithium nickel oxide (Co<sub>0.7</sub>LiNi<sub>0.3</sub>O<sub>2</sub>) 128975-24-6, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 143623-49-8, Cobalt lithium nickel oxide (Co<sub>0.25</sub>LiNi<sub>0.75</sub>O<sub>2</sub>) 179186-41-5, Lithium manganese nickel oxide (LiMn<sub>0.7</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 193214-24-3, Aluminum cobalt lithium nickel oxide (Al<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 193215-92-8, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 195880-90-1, Cobalt lithium magnesium nickel oxide (Co<sub>0.15</sub>LiMg<sub>0.05</sub>Ni<sub>0.8</sub>O<sub>2</sub>) 203005-76-9, Cobalt lithium borate oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>(BO<sub>3</sub>)<sub>0.05</sub>O<sub>1.85</sub>) 216385-46-5, Cobalt lithium nickel tin oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Sn<sub>0.05</sub>O<sub>2</sub>) 216385-49-8, Cobalt lithium nickel oxide silicate (Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>1.8</sub>(SiO<sub>4</sub>)<sub>0.05</sub>) 216385-50-1, Cobalt iron lithium nickel oxide (Co<sub>0.15</sub>Fe<sub>0.05</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 216385-51-2, Cobalt lithium nickel titanium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Ti<sub>0.05</sub>O<sub>2</sub>) 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 849416-68-8, Cobalt lithium nickel niobium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Nb<sub>0.05</sub>O<sub>2</sub>) 859529-03-6, Cobalt gallium lithium nickel oxide (Co<sub>0.15</sub>Ga<sub>0.05</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-92-8, Cobalt lithium nickel strontium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Sr<sub>0.05</sub>O<sub>2</sub>) 867248-93-9, Cobalt lithium nickel zinc oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Zn<sub>0.05</sub>O<sub>2</sub>) 867248-94-0, Calcium cobalt lithium nickel oxide (Ca<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-95-1, Chromium cobalt lithium nickel oxide (Cr<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-96-2, Cobalt lithium nickel oxide phosphate (Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>1.8</sub>(PO<sub>4</sub>)<sub>0.05</sub>) 867248-97-3, Cobalt lithium nickel vanadium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>V<sub>0.05</sub>O<sub>2</sub>) 867248-98-4, Antimony cobalt lithium nickel oxide (Sb<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 867248-99-5, Cobalt lithium nickel tantalum oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Ta<sub>0.05</sub>O<sub>2</sub>) 867249-00-1, Cobalt lithium molybdenum nickel oxide (Co<sub>0.15</sub>LiMo<sub>0.05</sub>Ni<sub>0.8</sub>O<sub>2</sub>) 867249-01-2, Cobalt lithium nickel zirconium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Zr<sub>0.05</sub>O<sub>2</sub>) 867249-02-3, Cobalt lithium nickel yttrium oxide (Co<sub>0.15</sub>LiNi<sub>0.8</sub>Y<sub>0.05</sub>O<sub>2</sub>) 867249-03-4 867249-04-5 867249-05-6 867249-06-7

RL: DEV (Device component use); USES (Uses)  
(cathode containing lithium nickel composite oxides and electrolytes containing vinyl ethylene carbonate for secondary lithium batteries)

IT 4427-96-7, Vinyl ethylene carbonate  
RL: MOA (Modifier or additive use); USES (Uses)  
(cathode containing lithium nickel composite oxides and electrolytes containing vinyl ethylene carbonate for secondary lithium batteries)

L3 ANSWER 34 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1084511 CAPLUS

DOCUMENT NUMBER: 144:215940

TITLE: Synthesis of Li[Ni<sub>0.475</sub>Co<sub>0.05</sub>Mn<sub>0.475</sub>]O<sub>2</sub> cathode materials via a carbonate process

AUTHOR(S): Shin, H.-S.; Park, S.-H.; Bae, Y. C.; Sun, Y.-K.

CORPORATE SOURCE: Department of Chemical Engineering, Center for Information and Communication Materials, Hanyang University, Seoul, 133-791, S. Korea

SOURCE: Solid State Ionics (2005), 176(35-36), 2577-2581  
CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode carbonate synthesis battery



IT Battery cathodes  
(synthesis of Li[Ni0.475Co0.05Mn0.475]O2 cathode material for lithium batteries through carbonate copptn.)

IT 876048-08-7, Cobalt manganese nickel carbonate (Co0.05Mn0.48Ni0.48(CO3))  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(in synthesis of Li[Ni0.475Co0.05Mn0.475]O2 cathode material for lithium batteries through carbonate copptn.)

IT 459408-76-5P, Cobalt lithium manganese nickel oxide (Co0.05LiMn0.48Ni0.48O2)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(synthesis of Li[Ni0.475Co0.05Mn0.475]O2 cathode material for lithium batteries through carbonate copptn.)

IT 7732-18-5, Water, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(synthesis of Li[Ni0.475Co0.05Mn0.475]O2 cathode material for lithium batteries through carbonate copptn.)

L3 ANSWER 35 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:1078019 CAPLUS  
DOCUMENT NUMBER: 143:369996  
TITLE: Nonaqueous electrolyte secondary battery  
INVENTOR(S): Takeuchi, Masanobu; Yoshimura, Seiji  
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
SOURCE: U.S. Pat. Appl. Publ., 13 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005221170	A1	20051006	US 2005-90002	20050328
PRIORITY APPLN. INFO.:			JP 2004-100864	A 20040330
			JP 2005-47671	A 20050223

TI Nonaqueous electrolyte secondary battery

AB A non-aqueous electrolyte secondary battery includes a pos. electrode, a neg. electrode, and a nonaq. electrolyte, and the neg. electrode contains a conductive agent and a neg. electrode active material including a lithium titanium oxide. The conductive agent in the neg. electrode includes graphitized vapor grown carbon fiber having a lattice constant C0 along a stacking direction of from 6.7 Å to 6.8 Å, as determined by X-ray diffraction.

ST nonaq electrolyte secondary battery

IT Carbon fibers, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(graphite; nonaq. electrolyte secondary battery)

IT Battery anodes  
Secondary batteries  
(nonaq. electrolyte secondary battery)

IT Carbonaceous materials (technological products)  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary battery)

IT 12031-95-7, Lithium titanium oxide (Li4Ti5O12) 12190-79-3, Cobalt lithium oxide (CoLiO2) 346417-97-8, Cobalt lithium manganese nickel oxide (Co0.33LiMn0.33Ni0.33O2) 390362-01-3, Cobalt lithium manganese nickel oxide (Co0.5LiMn0.25Ni0.25O2) 686740-96-5, Cobalt lithium manganese nickel oxide (Co0.67LiMn0.17Ni0.17O2) 866090-48-4, Cobalt lithium manganese nickel oxide (Co0-1LiMn0-0.5Ni0-1O2)  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery)

L3 ANSWER 36 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:1049245 CAPLUS

DOCUMENT NUMBER: 143:349929  
 TITLE: Mixed oxide blends for nonaqueous electrolyte secondary battery cathode materials and nonaqueous electrolyte secondary batteries  
 INVENTOR(S): Baba, Yasunori; Kitao, Hideki; Nakanishi, Naoya; Ikemachi, Takaaki; Noma, Toshiyuki  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005267956	A2	20050929	JP 2004-76417	20040317
PRIORITY APPLN. INFO.:			JP 2004-76417	20040317
TI	Mixed oxide blends for nonaqueous electrolyte secondary battery cathode materials and nonaqueous electrolyte secondary batteries			
AB	Mixts. of $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ ( $0.5 < x + y < 1.0$ ; $0.1 < y < 0.6$ ) containing F and spinel-structured $\text{Li}(1+a)\text{Mn}_{2-a-b}\text{M}_b\text{O}_4$ ( $\text{M} = \text{Al, Co, Ni, Mg, and/or Fe}$ ; $a = 0-0.2$ ; $b = 0-0.1$ ), preferably in 20:80-30:20 weight ratio, are claimed as the title cathode material. Nonaq. electrolyte secondary batteries including the said cathode materials are also claimed. The cathode materials are thermally stable.			
ST	mixed oxide blend nonaq electrolyte secondary battery cathode; spinel structure lithium manganese mixed oxide cathode; fluorine contg lithium nickel cobalt manganese oxide cathode			
IT	Battery cathodes (mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			
IT	Secondary batteries (nonaq. electrolyte; mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			
IT	865627-10-7, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.9}\text{LiMn}_{0.1-0.6}\text{Ni}_{0.5}\text{O}_2$ ) RL: DEV (Device component use); USES (Uses) (F-containing; mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			
IT	865627-09-4P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{1.03}\text{Mn}_{0.34}\text{Ni}_{0.33}\text{O}_2$ ) RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (F-containing; mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			
IT	7782-41-4, Fluorine, uses RL: MOA (Modifier or additive use); USES (Uses) (cobalt lithium manganese nickel oxide containing; mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			
IT	737006-34-7P RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			
IT	865627-08-3, Aluminum lithium manganese oxide ( $\text{Al}_{0.04}\text{Li}_{1.1}\text{Mn}_{1.88}\text{O}_2$ ) RL: DEV (Device component use); USES (Uses) (spinel-structured; mixture of F-containing $\text{Li}(\text{Ni,Co,Mn})\text{O}_2$ and spinel-type lithium manganese mixed oxides for cathode in nonaq. electrolyte secondary batteries)			

L3 ANSWER 37 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:1049231 CAPLUS  
 DOCUMENT NUMBER: 143:349928  
 TITLE: Nonaqueous electrolyte secondary batteries  
 with lithium mixed oxide cathodes  
 INVENTOR(S): Matsui, Toru; Deguchi, Masaki; Yoshizawa, Hiroshi  
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2005267911	A2	20050929	JP 2004-75110	20040316
PRIORITY APPLN. INFO.:				JP 2004-75110	20040316
TI	Nonaqueous electrolyte secondary batteries with lithium mixed oxide cathodes				
AB	The batteries comprise cathodes including LiAO <sub>2</sub> (A is ≥2 selected from Mn, Co, and Ni) or LiB <sub>1</sub> -wCwO <sub>2</sub> (B = Mn, Co, and/or Ni; C = Mg, Ca, Sr, Al, and/or Ga; w = 0.005-0.1) as active materials, anodes, and nonaq. electrolytes including a main solvent, solute, and diallyl carbonate as additive. The electrolytes may also contain vinylene carbonate as additive. The batteries show excellent cycle performance and prevented emission of gases at high temperature				
ST	nonaq electrolyte secondary battery lithium mixed oxide cathode; diallyl carbonate nonaq electrolyte additive secondary battery				
IT	Secondary batteries (nonaq.; secondary batteries with lithium mixed oxide cathodes and nonaq. electrolytes containing diallyl carbonate as additives)				
IT	Battery electrolytes (secondary batteries with lithium mixed oxide cathodes and nonaq. electrolytes containing diallyl carbonate as additives)				
IT	101920-93-8, Cobalt lithium nickel oxide (Co <sub>0.5</sub> LiNi <sub>0.5</sub> O <sub>2</sub> ) 113066-89-0, Cobalt lithium nickel oxide (Co <sub>0.2</sub> LiNi <sub>0.8</sub> O <sub>2</sub> ) 118819-08-2, Cobalt lithium manganese oxide (Co <sub>0.5</sub> LiMn <sub>0.5</sub> O <sub>2</sub> ) 128975-24-6, Lithium manganese nickel oxide (Li <sub>2</sub> MnNiO <sub>4</sub> ) 142447-10-7, Cobalt lithium manganese oxide (Co <sub>0.75</sub> LiMn <sub>0.25</sub> O <sub>2</sub> ) 143623-49-8, Cobalt lithium nickel oxide (Co <sub>0.25</sub> LiNi <sub>0.75</sub> O <sub>2</sub> ) 144419-56-7, Cobalt lithium magnesium oxide (Co <sub>0.95</sub> LiMg <sub>0.05</sub> O <sub>2</sub> ) 149319-02-8, Cobalt lithium nickel oxide (Co <sub>0.75</sub> LiNi <sub>0.25</sub> O <sub>2</sub> ) 152066-41-6, Cobalt lithium manganese nickel oxide (Co <sub>0.45</sub> LiMn <sub>0.1</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 193214-25-4, Aluminum cobalt lithium nickel oxide (Al <sub>0.05</sub> Co <sub>0.2</sub> LiNi <sub>0.75</sub> O <sub>2</sub> ) 193214-39-0, Aluminum cobalt lithium nickel oxide (Al <sub>0.1</sub> Co <sub>0.2</sub> LiNi <sub>0.7</sub> O <sub>2</sub> ) 193214-51-6, Aluminum cobalt lithium nickel oxide (Al <sub>0.15</sub> Co <sub>0.2</sub> LiNi <sub>0.65</sub> O <sub>2</sub> ) 197389-21-2, Aluminum lithium nickel oxide (Al <sub>0.03</sub> LiNi <sub>0.97</sub> O <sub>2</sub> ) 198213-70-6, Cobalt lithium magnesium oxide (Co <sub>0.98</sub> LiMg <sub>0.02</sub> O <sub>2</sub> ) 200938-46-1, Lithium manganese nickel oxide (Li <sub>2</sub> Mn <sub>1.5</sub> Ni <sub>0.5</sub> O <sub>4</sub> ) 225662-79-3, Aluminum cobalt lithium nickel oxide (Al <sub>0.01</sub> Co <sub>0.2</sub> LiNi <sub>0.79</sub> O <sub>2</sub> ) 248581-94-4, Cobalt lithium manganese oxide (Co <sub>0.5</sub> Li <sub>2</sub> Mn <sub>1.5</sub> O <sub>4</sub> ) 346417-97-8, Cobalt lithium manganese nickel oxide (Co <sub>0.33</sub> LiMn <sub>0.33</sub> Ni <sub>0.33</sub> O <sub>2</sub> ) 405890-05-3, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 459409-01-9, Aluminum cobalt lithium oxide (Al <sub>0.02</sub> Co <sub>0.98</sub> LiO <sub>2</sub> ) 659718-68-0, Aluminum cobalt lithium nickel oxide (Al <sub>0.03</sub> Co <sub>0.2</sub> LiNi <sub>0.77</sub> O <sub>2</sub> ) 781672-36-4, Lithium manganese nickel oxide (LiMn <sub>0.25</sub> Ni <sub>0.75</sub> O <sub>2</sub> ) 865649-43-0, Cobalt lithium manganese nickel oxide (Co <sub>0.45</sub> LiMn <sub>0.45</sub> Ni <sub>0.1</sub> O <sub>2</sub> ) 865649-44-1, Calcium cobalt lithium oxide (Ca <sub>0.02</sub> Co <sub>0.98</sub> LiO <sub>2</sub> ) 865649-45-2, Cobalt lithium strontium oxide (Co <sub>0.98</sub> LiSr <sub>0.02</sub> O <sub>2</sub> ) 865649-46-3, Cobalt gallium lithium oxide (Co <sub>0.98</sub> Ga <sub>0.02</sub> LiO <sub>2</sub> ) 865649-47-4, Gallium lithium nickel oxide (Ga <sub>0.03</sub> LiNi <sub>0.97</sub> O <sub>2</sub> ) 865649-48-5 865649-49-6, Aluminum cobalt lithium nickel oxide (Al <sub>0.07</sub> Co <sub>0.2</sub> LiNi <sub>0.73</sub> O <sub>2</sub> ) 865649-50-9, Aluminum cobalt lithium nickel oxide (Al <sub>0.12</sub> Co <sub>0.2</sub> LiNi <sub>0.68</sub> O <sub>2</sub> )				
RL:	DEV (Device component use); TEM (Technical or engineered material)				

use); USES (Uses)  
(cathode active material; secondary batteries with lithium  
mixed oxide cathodes and nonaq. electrolytes containing diallyl carbonate  
as additives)

IT 872-36-6, Vinylene carbonate 15022-08-9, Diallyl carbonate  
RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)  
(electrolyte additive; secondary batteries with lithium mixed  
oxide cathodes and nonaq. electrolytes containing diallyl carbonate as  
additives)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 623-53-0,  
Ethyl methyl carbonate  
RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(electrolyte solvent; secondary batteries with lithium mixed  
oxide cathodes and nonaq. electrolytes containing diallyl carbonate as  
additives)

IT 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(electrolyte; secondary batteries with lithium mixed oxide  
cathodes and nonaq. electrolytes containing diallyl carbonate as additives)

L3 ANSWER 38 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:1042973 CAPLUS  
DOCUMENT NUMBER: 144:471234  
TITLE: Development of secondary lithium battery  
"EX25A" using cathode active mass of  $\text{LiCo}_x\text{Mn}_y\text{Ni}_z\text{O}_2$  ( $x + y + z = 1$ )  
AUTHOR(S): Iguchi, Takaaki; Okamoto, Katsuhiko; Kuratomi,  
Junichi; Ohkawa, Kouji; Kohno, Kenji; Izuchi, Shuichi  
CORPORATE SOURCE: Japan  
SOURCE: GS Yuasa Technical Report (2004), 1(1), 25-31  
CODEN: GYTRA8; ISSN: 1349-7618  
URL: [http://www.gs-yuasa.com/jp/technic/nol/pdf/001\\_1\\_025.pdf](http://www.gs-yuasa.com/jp/technic/nol/pdf/001_1_025.pdf)  
PUBLISHER: GS Yuasa Corp.  
DOCUMENT TYPE: Journal; (online computer file)  
LANGUAGE: Japanese

TI Development of secondary lithium battery "EX25A" using cathode  
active mass of  $\text{LiCo}_x\text{Mn}_y\text{Ni}_z\text{O}_2$  ( $x + y + z = 1$ )

AB The 25 Ah secondary lithium battery "EX25A" with high  
performance has been developed using a new  $\text{LiCo}_x\text{Mn}_y\text{Ni}_z\text{O}_2$  ( $x + y + z = 1$ )  
cathode active mass for industrial applications. This material is  
uniformly crystallized and is able to be synthesized by firing a precursor of a  
Co-Mn-Ni composite hydroxide produced by reactive crystallization and a Li source  
material resulting in the superior high rate performance and longer life  
for the cathode active material for the battery. The  
battery is able to be charged up to 90% capacity at 5 CA within 15  
min and the discharge capacity at 5 CA is  $\geq 95\%$  of that of 0.2 CA.  
The maximum output power at 30 s is 2,500 W, 1,800 W  $\text{kg}^{-1}$  at the condition  
SOC 100%. The value of capacity retention after 3000 cycles at 45°  
and after stored for 10 years at 100% SOC at 25° is 70% and 60%,  
resp. The battery will be therefore suitable for the industrial  
applications which strongly demand rapid charge, high power and long life.

ST secondary battery cathode lithium cobalt manganese nickel oxide

IT Battery cathodes  
(development of secondary lithium batteries containing lithium  
cobalt manganese nickel oxides as cathode active mass)

IT Secondary batteries  
(lithium; development of secondary lithium batteries containing  
lithium cobalt manganese nickel oxides as cathode active mass)

IT 12057-17-9, Lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ) 12190-79-3, Cobalt lithium  
oxide ( $\text{CoLiO}_2$ ) 346417-97-8, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 532934-40-0, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.16}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 686740-96-5, Cobalt lithium

manganese nickel oxide (Co<sub>0.67</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(development of secondary lithium batteries containing lithium  
cobalt manganese nickel oxides as cathode active mass)

L3 ANSWER 39 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:1002629 CAPLUS  
DOCUMENT NUMBER: 144:91021  
TITLE: Electrochemical performance of layered  
Li[Ni<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>]O<sub>2</sub> cathode materials synthesized by a  
sol-gel method  
AUTHOR(S): Chen, Ching-Hsiang; Wang, Chih-Jen; Hwang, Bing-Joe  
CORPORATE SOURCE: Nanoelectrochemistry Laboratory, Department of  
Chemical Engineering, National Taiwan University of  
Science and Technology, Taipei, 106, Taiwan  
SOURCE: Journal of Power Sources (2005), 146(1-2), 626-629  
CODEN: JPSODZ; ISSN: 0378-7753  
PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
ST layered cobalt lithium manganese nickel oxide cathode lithium  
battery  
IT Battery cathodes  
Sol-gel processing  
(layered Li[Ni<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>]O<sub>2</sub> cathode material for lithium  
batteries synthesized by sol-gel processing)  
IT Materials  
(layered; layered Li[Ni<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>]O<sub>2</sub> cathode material for lithium  
batteries synthesized by sol-gel processing)  
IT Secondary batteries  
(lithium; layered Li[Ni<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>]O<sub>2</sub> cathode material for lithium  
batteries synthesized by sol-gel processing)  
IT 128975-24-6P, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
193215-96-2P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 346417-97-8P, Cobalt lithium manganese nickel  
oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 405890-05-3P, Cobalt lithium  
manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 468772-63-6P, Cobalt  
lithium manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.38</sub>Ni<sub>0.38</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(layered Li[Ni<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>]O<sub>2</sub> cathode material for lithium  
batteries synthesized by sol-gel processing)

L3 ANSWER 40 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:1002625 CAPLUS  
DOCUMENT NUMBER: 144:91017  
TITLE: Effect of cathode structure on cell performance in  
wireless charging process  
AUTHOR(S): Hu, Shao-Kang; Chou, Tse-Chuan; Hwang, Bing-Joe  
CORPORATE SOURCE: Department of Chemical Engineering, National Cheng  
Kung University, Tainan, 701, Taiwan  
SOURCE: Journal of Power Sources (2005), 146(1-2), 606-610  
CODEN: JPSODZ; ISSN: 0378-7753  
PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
AB The application of micro-systems that contain monitoring or actuating  
devices is often hampered by energy supply. For systems with low power  
demand the use of an implanted battery or inductive links for  
wireless energy transfer to the remote system is a solution. However, these  
energy systems are limited by energy shortage and inductive coil  
alignment. The misalignment of wireless energy transfer loops results in

poor energy transfer efficiency and inexact induced potential. An implanted battery offers a stable energy supply, but energy storage in a battery is limited. A wireless microwave charging module was developed to overcome the disadvantages of these methods. A wireless microwave charging module can charge an implanted Li-ion battery at a suitable distance by tuning the power input. Such an implanted Li-ion battery has good cycleability after 20 cycles of wireless charging. Although the energy conversion of wireless microwave charging is only 2-5%, it can be improved by using other designs of antenna (microwave generation component) and rectifying antennas (receive and conversion components). The performance of spinel-type compds. for wireless energy transfer is better than that of layered compds.

ST cathode structure wireless microwave charging lithium battery  
IT Battery cathodes  
Microwave

(effect of crystal structure of cathode material on battery performance in wireless microwave charging)

IT Secondary batteries  
(lithium; effect of crystal structure of cathode material on battery performance in wireless microwave charging)

IT 12057-17-9, Lithium manganese oxide (LiMn2O4) 405890-05-3, Cobalt lithium manganese nickel oxide (Co0.1LiMn0.45Ni0.45O2)  
RL: DEV (Device component use); USES (Uses)  
(cathode; effect of crystal structure of cathode material on battery performance in wireless microwave charging)

L3 ANSWER 41 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1002623 CAPLUS

DOCUMENT NUMBER: 144:394500

TITLE: Synthesis of (1-2x)LiNi1/2Mn1/2O2·xLi[Lil/3Mn2/3]O2·xLiCoO2 (0 ≤ x ≤ 0.5)  
electrode materials and comparative study on cooling rate

AUTHOR(S): Zhang, Lianqi; Takada, Kazunori; Ohta, Narumi; Fukuda, Katsutoshi; Sasaki, Takayoshi

CORPORATE SOURCE: Advanced Materials Laboratory, National Institute for Materials Science, Tsukuba, Ibaraki, 305-0044, Japan

SOURCE: Journal of Power Sources (2005), 146(1-2), 598-601  
CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode synthesis lithium battery

IT Battery cathodes  
Cooling

(effect of cooling rate in synthesis of (1-2x)LiNi1/2Mn1/2O2·xLi[Lil/3Mn2/3]O2·xLiCoO2 (0 ≤ x ≤ 0.5) cathode material for lithium batteries)

IT Secondary batteries  
(lithium; effect of cooling rate in synthesis of (1-2x)LiNi1/2Mn1/2O2·xLi[Lil/3Mn2/3]O2·xLiCoO2 (0 ≤ x ≤ 0.5) cathode material for lithium batteries)

IT 128975-24-6P, Lithium manganese nickel oxide (LiMn0.5Ni0.5O2)  
184909-55-5P, Cobalt lithium manganese oxide (Co0.5Li1.17Mn0.33O2)  
648436-14-0P, Cobalt lithium manganese nickel oxide (Co0.3Li1.1Mn0.4Ni0.2O2) 845929-83-1P, Cobalt lithium manganese nickel oxide (Co0.2Li1.07Mn0.43Ni0.3O2) 845929-84-2P, Cobalt lithium manganese nickel oxide (Co0.1Li1.03Mn0.47Ni0.4O2) 882731-33-1P, Cobalt lithium manganese nickel oxide (Co0.4Li1.13Mn0.37Ni0.1O2)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(effect of cooling rate in synthesis of (1-

2x)LiNi<sub>1</sub>/2Mn<sub>1</sub>/2O<sub>2</sub>·xLi[Lil/3Mn<sub>2</sub>/3]O<sub>2</sub>·xLiCoO<sub>2</sub> (0≤ x ≤0.5) cathode material for lithium batteries)

L3 ANSWER 42 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1002621 CAPLUS

DOCUMENT NUMBER: 144:91015

TITLE: Characterization of Lil+yNixCol-2xMnxO<sub>2</sub> positive active materials for lithium ion batteries

AUTHOR(S): Shizuka, Kenji; Kobayashi, Takako; Okahara, Kenji; Okamoto, Kaoru; Kanzaki, Shou; Kanno, Ryoji

CORPORATE SOURCE: Mitsubishi Chemical Group Science and Technology Research Center Inc., Aoba-ku, Yokohama, 227-8502, Japan

SOURCE: Journal of Power Sources (2005), 146(1-2), 589-593  
CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Characterization of Lil+yNixCol-2xMnxO<sub>2</sub> positive active materials for lithium ion batteries

AB Layered Lil+yNixCol-2xMnxO<sub>2</sub> material was prepared by solid-state reactions at 950° for 10 h in air and characterized by various methods. Battery performance depended on the composition. The rate performance deteriorated as Co content, (1-2x), decreased. However, it improved as excess Li content (y) increased. The change in battery performance associated with composition variations was related to the structural disorder (cation mixing) and the elec. conductivity (volume resistivity). The degree of cation mixing depended on Co content, but the volume resistivity depended on excess Li content. Battery performance improved with a decrease in cation mixing and volume resistivity. Only Ni K-edge XANES spectra showed edge shifts to higher energies due to the oxidation of Ni as either Co content (1-2x) or excess Li content (y) increased. The unit cell size decreased as the Co content or excess Li content increased. This is caused by the change from Ni<sup>2+</sup> (r=0.69 Å) to the smaller Ni<sup>3+</sup> (r=0.56 Å). It is assumed that the decrease in volume resistivity is related to the increase in Ni<sup>3+</sup> concentration in Lil+yNixCol-2xMnxO<sub>2</sub>.

ST cobalt lithium manganese nickel oxide cathode lithium ion battery

IT Battery cathodes  
(characterization of Lil+yNixCol-2xMnxO<sub>2</sub> cathode materials for lithium-ion batteries)

IT Secondary batteries  
(lithium; characterization of Lil+yNixCol-2xMnxO<sub>2</sub> cathode materials for lithium-ion batteries)

IT 193215-96-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 247565-42-0, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.05</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 405890-05-3, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 459408-76-5, Cobalt lithium manganese nickel oxide (Co<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 477567-62-7, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.05</sub>Mn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 532934-38-6, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 807654-96-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.15</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 807654-99-5, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.2</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 872418-77-4, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>Li<sub>1.05</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 872418-79-6, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>Li<sub>1.1</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 872418-80-9, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>Li<sub>1.15</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 872418-81-0, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>Li<sub>1.2</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 872418-82-1, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.1</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 872418-83-2, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.1</sub>Mn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 872418-84-3, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.15</sub>Mn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 872418-85-4, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.2</sub>Mn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 872418-86-5, Cobalt lithium manganese

nickel oxide (Co<sub>0.05</sub>Li<sub>1.05</sub>Mn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 872418-87-6, Cobalt  
lithium manganese nickel oxide (Co<sub>0.05</sub>Li<sub>1.1</sub>Mn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>)  
872418-88-7, Cobalt lithium manganese nickel oxide  
(Co<sub>0.05</sub>Li<sub>1.15</sub>Mn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 872418-90-1, Cobalt lithium  
manganese nickel oxide (Co<sub>0.05</sub>Li<sub>1.2</sub>Mn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(characterization of Li<sub>1+y</sub>Ni<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>O<sub>2</sub> cathode materials for  
lithium-ion batteries)

L3 ANSWER 43 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:962566 CAPLUS  
DOCUMENT NUMBER: 143:251015  
TITLE: Cathode active material with improved cycling  
stability for lithium ion batteries  
INVENTOR(S): Bormet, Steffen; Reim, Joerg; Rentsch, Harald;  
Schelling, Volker  
PATENT ASSIGNEE(S): Ferro G.m.b.H., Germany  
SOURCE: PCT Int. Appl., 18 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005081338	A1	20050901	WO 2005-EP600	20050121
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 102004008397	A1	20050908	DE 2004-102004008397	20040220
PRIORITY APPLN. INFO.:			DE 2004-102004008397A	20040220
REFERENCE COUNT:	7	THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		
TI	Cathode active material with improved cycling stability for lithium ion batteries			
AB	The invention relates to a pos. active electrode material for use in rechargeable lithium ion batteries, to a lithium secondary cell having the electrode material according to the invention, and to a method for the production of the latter. The cathode active material is: La <sub>a</sub> Ni <sub>1-x-y-z</sub> Mn <sub>x</sub> Co <sub>y</sub> MzO <sub>2</sub> , where M = Nb and/or Ta, and 1.00 ≤ a ≤ 1.15, 0.5 < x+y+z < 1.0, 0.1 < x < 0.5, 0.01 < y < 0.3, and 0 < z ≤ 0.1.			
ST	lithium battery cathode improved cycling stability			
IT	Ball milling Battery cathodes Grinding (machining) Heat treatment (cathode active material with improved cycling stability for lithium ion batteries)			
IT	Secondary batteries (lithium; cathode active material with improved cycling stability for lithium ion batteries)			
IT	7439-93-2, Lithium, uses 7439-93-2D, Lithium, compound RL: DEV (Device component use); USES (Uses) (cathode active material with improved cycling stability for lithium ion batteries)			
IT	405890-05-3P, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 863498-38-8P 863498-39-9P 863498-40-2P			



863498-41-3P 863498-42-4P 863498-43-5P  
863498-44-6P 863498-45-7P 863498-46-8P  
863498-47-9P 863499-34-7P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(cathode active material with improved cycling stability for lithium  
ion batteries)

L3 ANSWER 44 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:960521 CAPLUS

DOCUMENT NUMBER: 143:269593

TITLE: Secondary lithium batteries with laminated  
aluminum packages

INVENTOR(S): Kono, Kazushige; Kasai, Masahiro; Yagi, Yoshin

PATENT ASSIGNEE(S): Shin-Kobe Electric Machinery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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	JP 2005235601	A2	20050902	JP 2004-43788	20040220
PRIORITY APPLN. INFO.:				JP 2004-43788	20040220
TI	Secondary lithium batteries with laminated aluminum packages				
AB	Secondary lithium batteries sealed with laminated Al is characterized by having their (sealed area)/(projected area of the battery) ratio of 12-25 area%. Preferably, the batteries include $\text{LiMn}_x\text{Ni}_{1-x-y}\text{Co}_y\text{O}_2$ ( $x, y = 0.001-0.5$ ) as cathodes and amorphous C as anodes. The laminates are lightwt. and have sufficient mech. strength.				
ST	secondary lithium battery laminated aluminum package; amorphous carbon anode lightwt battery; lithium manganese oxide cathode battery				
IT	Packaging materials (laminated films, aluminum; lightwt. secondary lithium batteries with strong laminated aluminum packages)				
IT	Secondary batteries (lithium; lightwt. secondary lithium batteries with strong laminated aluminum packages)				
IT	7440-44-0, Carbon, uses RL: DEV (Device component use); USES (Uses) (amorphous, anode; lightwt. secondary lithium batteries with strong laminated aluminum packages)				
IT	12057-17-9, Lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ) 863646-33-7, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0-0.5}\text{LiMn}_{0-0.5}\text{Ni}_{0-1}\text{O}_2$ ) RL: DEV (Device component use); USES (Uses) (cathode; lightwt. secondary lithium batteries with strong laminated aluminum packages)				
IT	7429-90-5, Aluminum, uses RL: DEV (Device component use); USES (Uses) (laminated, packaging; lightwt. secondary lithium batteries with strong laminated aluminum packages)				

L3 ANSWER 45 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:958639 CAPLUS

DOCUMENT NUMBER: 144:111136

TITLE: Structural and electrochemical characterization of the  
layered  $\text{LiNi}_{0.5-y}\text{Mn}_{0.5-y}\text{Co}_{2y}\text{O}_2$  ( $0 \leq y \leq 1$ )  
cathodes

AUTHOR(S): Choi, J.; Manthiram, A.

CORPORATE SOURCE: Materials Science and Engineering Program, The  
University of Texas at Austin, Austin, TX, 78712, USA

SOURCE: Solid State Ionics (2005), 176(29-30), 2251-2256

CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST layered cobalt lithium manganese nickel oxide cathode lithium  
battery  
IT Air  
(in synthesis of layered  $\text{LiNi}_{0.5}\text{-yMn}_{0.5}\text{-yCo}_2\text{yO}_2$  cathodes for lithium  
batteries)  
IT Secondary batteries  
(lithium; structural and electrochem. characterization of layered  
 $\text{LiNi}_{0.5}\text{-yMn}_{0.5}\text{-yCo}_2\text{yO}_2$  cathodes for lithium batteries)  
IT Battery cathodes  
(structural and electrochem. characterization of layered  
 $\text{LiNi}_{0.5}\text{-yMn}_{0.5}\text{-yCo}_2\text{yO}_2$  cathodes for lithium batteries)  
IT 12017-00-4D, Cobalt oxide ( $\text{CoO}_2$ ), oxygen-deficient 522613-35-0D,  
Manganese nickel oxide ( $\text{MnNiO}_4$ ), oxygen-deficient 868844-20-6D, Cobalt  
manganese nickel oxide ( $\text{Co}_{0.33}\text{Mn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ), oxygen-deficient  
872998-55-5D, Cobalt manganese nickel oxide ( $\text{Co}_{0.5}\text{Mn}_{0.25}\text{Ni}_{0.25}\text{O}_2$ ),  
oxygen-deficient 872998-56-6D, Cobalt manganese nickel oxide  
( $\text{Co}_{0.41}\text{Mn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ ), oxygen-deficient 872998-57-7D, Cobalt manganese  
nickel oxide ( $\text{Co}_{0.15}\text{Mn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ), oxygen-deficient  
RL: NUU (Other use, unclassified); USES (Uses)  
(in structural and electrochem. characterization of layered  
 $\text{LiNi}_{0.5}\text{-yMn}_{0.5}\text{-yCo}_2\text{yO}_2$  cathodes for lithium batteries)  
IT 7782-44-7, Oxygen, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(in synthesis of layered  $\text{LiNi}_{0.5}\text{-yMn}_{0.5}\text{-yCo}_2\text{yO}_2$  cathodes for lithium  
batteries)  
IT 12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 128975-24-6, Lithium manganese  
nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 390362-01-3, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.5}\text{LiMn}_{0.25}\text{Ni}_{0.25}\text{O}_2$ ) 405890-05-3, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 459408-76-5,  
Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.05}\text{LiMn}_{0.48}\text{Ni}_{0.48}\text{O}_2$ )  
697766-76-0, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.15}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 781672-38-6, Cobalt lithium manganese nickel  
oxide ( $\text{Co}_{0.58}\text{LiMn}_{0.21}\text{Ni}_{0.21}\text{O}_2$ ) 854546-03-5, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.34}\text{Ni}_{0.34}\text{O}_2$ ) 854546-04-6, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.41}\text{LiMn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ )  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(structural and electrochem. characterization of layered  
 $\text{LiNi}_{0.5}\text{-yMn}_{0.5}\text{-yCo}_2\text{yO}_2$  cathodes for lithium batteries)

L3 ANSWER 46 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:901283 CAPLUS  
DOCUMENT NUMBER: 144:8912  
TITLE: Structure, morphology and electrochemical properties  
of  $\text{LiNi}_{0.5}\text{Mn}_{0.5}\text{-xCoxO}_2$  prepared by solid state  
reaction  
AUTHOR(S): Li, Decheng; Sasaki, Yuki; Kageyama, Masaya;  
Kobayakawa, Koichi; Sato, Yuichi  
CORPORATE SOURCE: High-Tech Research Center, Kanagawa University,  
Yokohama, 221-8686, Japan  
SOURCE: Journal of Power Sources (2005), 148, 85-89  
CODEN: JPSODZ; ISSN: 0378-7753  
PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide prepn structure property; cathode  
cobalt lithium manganese nickel oxide battery  
IT 176206-89-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.2}\text{Ni}_{0.5}\text{O}_2$ )  
191024-83-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.1}\text{Ni}_{0.5}\text{O}_2$ )  
193215-53-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.3}\text{Ni}_{0.5}\text{O}_2$ )

193215-92-8, Cobalt lithium manganese nickel oxide  
(Co<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PRP (Properties); PROC (Process)  
(structure, morphol. and electrochem. properties of cobalt lithium  
manganese nickel oxide prepared by solid state reaction)

L3 ANSWER 47 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:734631 CAPLUS  
DOCUMENT NUMBER: 144:394378  
TITLE: The effect of Ti<sup>4+</sup>, Mg<sup>2+</sup> co-doping on performance of  
LiNi<sub>0.4</sub>Co<sub>0.2</sub>Mn<sub>0.4</sub>O<sub>2</sub>  
AUTHOR(S): Huang, You-Yuan; Zhou, Heng-Hui; Chen, Ji-Tao; Gao,  
De-Shu; Su, Guang-Yao  
CORPORATE SOURCE: College of Chemistry, Xiangtan University, Xiangtan,  
411105, Peop. Rep. China  
SOURCE: Wuli Huaxue Xuebao (2005), 21(7), 725-729  
CODEN: WHXUEU; ISSN: 1000-6818  
PUBLISHER: Wuli Huaxue Xuebao Bianjibu  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese

ST cobalt lithium manganese nickel oxide cathode lithium battery;  
lithium battery cathode titanium magnesium codoping  
IT Battery cathodes  
(effect of Ti<sup>4+</sup> and Mg<sup>2+</sup> co-doping on performance of  
LiNi<sub>0.4</sub>Co<sub>0.2</sub>Mn<sub>0.4</sub>O<sub>2</sub> cathode material for lithium batteries)  
IT Secondary batteries  
(lithium; effect of Ti<sup>4+</sup> and Mg<sup>2+</sup> co-doping on performance of  
LiNi<sub>0.4</sub>Co<sub>0.2</sub>Mn<sub>0.4</sub>O<sub>2</sub> cathode material for lithium batteries)  
IT 193215-96-2, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 882695-67-2 882695-69-4  
RL: DEV (Device component use); USES (Uses)  
(effect of Ti<sup>4+</sup> and Mg<sup>2+</sup> co-doping on performance of  
LiNi<sub>0.4</sub>Co<sub>0.2</sub>Mn<sub>0.4</sub>O<sub>2</sub> cathode material for lithium batteries)  
IT 16043-45-1, Titanium (4+), uses 22537-22-0, Magnesium (2+), uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(effect of Ti<sup>4+</sup> and Mg<sup>2+</sup> co-doping on performance of  
LiNi<sub>0.4</sub>Co<sub>0.2</sub>Mn<sub>0.4</sub>O<sub>2</sub> cathode material for lithium batteries)

L3 ANSWER 48 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:632450 CAPLUS  
DOCUMENT NUMBER: 143:156301  
TITLE: Mixed oxide cathode active materials for secondary  
lithium batteries and secondary lithium  
batteries  
INVENTOR(S): Kasai, Masahiro; Yuasa, Toyotaka  
PATENT ASSIGNEE(S): Hitachi Ltd., Japan; Shin-Kobe Electric Machinery Co.,  
Ltd.  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005196992	A2	20050721	JP 2003-435483	20031226
PRIORITY APPLN. INFO.:			JP 2003-435483	20031226
TI	Mixed oxide cathode active materials for secondary lithium batteries and secondary lithium batteries			
AB	The title cathode active materials (1) are layer-structured mixed oxides containing Li, Ni, Mn, and Co and $\geq 1$ rare earth oxides, (2) comprise Li <sub>x</sub> Ni <sub>a</sub> Mn <sub>b</sub> Co <sub>c</sub> O <sub>2</sub> and RE <sub>2</sub> O <sub>3</sub> , where RE is trivalent rare earth metals, $0 < x < 1.2$ , $a + b + c = 1$ , $0 < a < 1$ , $0 < b < 1$ , and $0 < c < 1$ , or (3) Li-, Ni-, Mn-, and Co-containing mixed oxide primary particles with their surfaces			

equipped with  $\geq 1$  rare earth oxide fine-grain particles. Secondary lithium batteries including the said cathodes are also claimed. The batteries show high energy d. and are especially suitable for on-vehicle use.

ST secondary lithium battery mixed oxide cathode; rare earth oxide contg lithium mixed oxide cathode; cathode lithium nickel manganese cobalt oxide

IT Secondary batteries

(lithium; secondary lithium batteries with Co Li Mn Ni rare earth mixed oxide cathode active materials)

IT Battery cathodes

(secondary lithium batteries with Co Li Mn Ni rare earth mixed oxide cathode active materials)

IT 296800-21-0, Cobalt lithium manganese nickel oxide

((Co,Mn,Ni)LiO-1.2O<sub>2</sub>) 860018-44-6, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>Li<sub>1.02</sub>Mn<sub>0.2</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 860018-45-7, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>Li<sub>1.02</sub>Mn<sub>0.33</sub>Ni<sub>0.34</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(secondary lithium batteries with Co Li Mn Ni rare earth mixed oxide cathode active materials)

IT 1306-38-3, Cerium oxide (CeO<sub>2</sub>), uses 1308-87-8, Dysprosium oxide (Dy<sub>2</sub>O<sub>3</sub>)

1308-96-9, Europium oxide (Eu<sub>2</sub>O<sub>3</sub>) 1312-81-8, Lanthanum oxide (La<sub>2</sub>O<sub>3</sub>)

1313-97-9, Neodymium oxide (Nd<sub>2</sub>O<sub>3</sub>) 1314-36-9, Yttrium oxide (Y<sub>2</sub>O<sub>3</sub>), uses

1314-37-0, Ytterbium oxide (Yb<sub>2</sub>O<sub>3</sub>) 12032-20-1, Lutetium oxide (Lu<sub>2</sub>O<sub>3</sub>)

12036-32-7, Praseodymium oxide (Pr<sub>2</sub>O<sub>3</sub>) 12036-41-8, Terbium oxide (Tb<sub>2</sub>O<sub>3</sub>)

12055-62-8, Holmium oxide (Ho<sub>2</sub>O<sub>3</sub>) 12060-58-1, Samarium oxide (Sm<sub>2</sub>O<sub>3</sub>)

12061-16-4, Erbium oxide (Er<sub>2</sub>O<sub>3</sub>) 12064-62-9, Gadolinium oxide (Gd<sub>2</sub>O<sub>3</sub>)

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(secondary lithium batteries with Co Li Mn Ni rare earth mixed oxide cathode active materials)

L3 ANSWER 49 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:606353 CAPLUS

DOCUMENT NUMBER: 143:118038

TITLE: Secondary lithium battery and method for its initial activation

INVENTOR(S): Fujii, Akihiro; Shiozaki, Ryuji; Nukuta, Toshiyuki

PATENT ASSIGNEE(S): Yuasa Corporation, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005190874	A2	20050714	JP 2003-432151	20031226
PRIORITY APPLN. INFO.:			JP 2003-432151	20031226

TI Secondary lithium battery and method for its initial activation

AB The claimed battery, for functioning at 4.3-4.6 V, is equipped with a cathode containing  $\alpha$ -NaFeO<sub>2</sub>-type layered structure Li-transition metal compound and a nonaq. electrolyte containing vinylene carbonate. The battery is charged at 4.3-4.6 V for 10-500 h for the initial activation. The battery provides high storage stability.

ST initial activation secondary lithium battery electrolyte vinylene carbonate; lithium transition metal oxide cathode secondary battery

IT Battery cathodes

Battery electrolytes

(initial activation of secondary lithium battery containing vinylene carbonate)

IT Secondary batteries

(lithium; initial activation of secondary lithium battery containing vinylene carbonate)

IT 346417-97-8, Cobalt lithium manganese nickel oxide  
(Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 686740-96-5, Cobalt lithium manganese nickel  
oxide (Co<sub>0.67</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>) 686740-97-6, Cobalt lithium  
manganese nickel oxide (Co<sub>0.17</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(cathodes; initial activation of secondary lithium battery  
containing vinylene carbonate)

IT 872-36-6, Vinylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte containing; initial activation of secondary lithium  
battery containing vinylene carbonate)

L3 ANSWER 50 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:572419 CAPLUS  
DOCUMENT NUMBER: 143:81215  
TITLE: Cathode material for lithium secondary battery  
INVENTOR(S): Yuasa, Toyotaka; Kasai, Masahiro  
PATENT ASSIGNEE(S): Japan  
SOURCE: U.S. Pat. Appl. Publ., 13 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005142442	A1	20050630	US 2004-20034	20041223
JP 2005197004	A2	20050721	JP 2003-435660	20031226
CN 1638173	A	20050713	CN 2004-10011485	20041224
			JP 2003-435660	A 20031226

PRIORITY APPLN. INFO.:

TI Cathode material for lithium secondary battery

AB A pos. electrode material for a nonaq. lithium secondary battery  
and a lithium secondary battery that has superior cycle life and  
safety and reduced internal resistance of the battery at low  
temperature is provided. The pos. electrode material for a nonaq. lithium  
secondary battery comprises a layered structured complex oxide  
expressed by a composition formula  $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{M}_\alpha\text{O}_2$ , where  
 $0 < a \leq 1.2$ ,  $0.1 \leq x \leq 0.9$ ,  $0 \leq y \leq 0.44$ ,  
 $0.1 \leq z \leq 0.6$ ,  $0.01 \leq \alpha \leq 0.1$ , and  
 $x+y+z+\alpha=1$ . A diffraction peak intensity ratio between the (003)  
plane and the (104) plane ( $I(003)/I(104)$ ) in an X-ray powder  
diffractometry using a Cu-K $\alpha$  line in the X-ray source is not less  
than 1.0 and not more than 1.5.

ST cathode material lithium secondary battery; safety lithium  
secondary battery

IT Battery cathodes  
Surface area  
(cathode material for lithium secondary battery)

IT Secondary batteries  
(lithium; cathode material for lithium secondary battery)

IT 186298-15-7 186298-17-9 217309-43-8, Cobalt lithium manganese nickel  
oxide (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 478037-17-1 493326-93-5, Cobalt lithium  
manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.34</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 681160-59-8, Cobalt  
lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.4</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 855998-68-4  
, Cobalt lithium manganese nickel oxide (Co<sub>0.1-0.6</sub>Li<sub>0-1.2</sub>Mn<sub>0.1-0.9</sub>Ni<sub>0-0.44</sub>O<sub>2</sub>)  
855998-69-5 855998-70-8 855998-71-9 855998-72-0  
855998-73-1 855998-74-2 855998-75-3 855998-76-4 855998-77-5  
855998-78-6 855998-79-7 855998-80-0  
RL: DEV (Device component use); USES (Uses)

(cathode material for lithium secondary battery)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(cathode material for lithium secondary battery)

L3 ANSWER 51 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:572418 CAPLUS  
 DOCUMENT NUMBER: 143:100336  
 TITLE: Lithium ion secondary battery  
 INVENTOR(S): Yamaki, Takahiro; Arai, Juichi  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 12 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005142440	A1	20050630	US 2004-17944	20041222
JP 2005197002	A2	20050721	JP 2003-435626	20031226
FR 2864708	A1	20050701	FR 2004-53227	20041224
			JP 2003-435626	A 20031226

PRIORITY APPLN. INFO.:

TI Lithium ion secondary battery  
 AB A lithium ion secondary battery is disclosed having high output characteristics even at an extremely low temperature, for example,  $-30^{\circ}$  and high output power even in a low charged state. A graphite-based material having an R value (IRD/IRG) which is the ratio of peak intensity (IRD) at 1,300 to 1,400  $\text{cm}^{-1}$  to peak intensity (IRG) at 1,580 to 1,620  $\text{cm}^{-1}$  measured in its Raman spectrum of 0.3 to 0.6 and an H value (IH(110)/IH(004)) which is the ratio of the peak height intensity (IH(110)) of the face (110) to the peak height intensity (IH(004)) of the face (004) in its X-ray diffraction of 0.5 to 2.0 or a C value which is the ratio of the peak integral intensity (IC(110)) of the face (110) to the peak integral intensity (IC(004)) of the face (004) of 0.4 to 1.50 is used as a neg.-electrode active material.  
 ST lithium ion secondary battery  
 IT Battery anodes  
 Battery cathodes  
 (lithium ion secondary battery)  
 IT Secondary batteries  
 (lithium; lithium ion secondary battery)  
 IT 7782-42-5, Graphite, uses 12057-17-9, Lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ) 12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 21324-40-3, Lithium hexafluorophosphate 187100-95-4, Aluminum lithium nickel oxide ( $\text{Al}_{0.05}\text{Co}_{0.3}\text{LiNi}_{0.7}\text{O}_{2.95}$ ) 190902-96-6, Cobalt lithium nickel oxide ( $\text{Co}_{0.05}\text{Co}_{0.3}\text{LiNi}_{0.7}\text{O}_{2.95}$ ) 193214-24-3, Aluminum cobalt lithium nickel oxide ( $\text{Al}_{0.05}\text{Co}_{0.15}\text{LiNi}_{0.8}\text{O}_2$ ) 193215-96-2, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) 856700-19-1 856700-20-4 856700-21-5 856700-22-6 856700-24-8 856700-26-0 856700-28-2, Lithium manganese nickel oxide ( $\text{LiMn}_{0.05}\text{Co}_{0.3}\text{Ni}_{0.7}\text{O}_{2.95}$ ) 856700-29-3, Iron lithium nickel oxide ( $\text{Fe}_{0.05}\text{Co}_{0.3}\text{LiNi}_{0.7}\text{O}_{2.95}$ ) 856700-30-6, Chromium lithium nickel oxide ( $\text{Cr}_{0.05}\text{Co}_{0.3}\text{LiNi}_{0.7}\text{O}_{2.95}$ ) 856700-31-7, Copper lithium nickel oxide ( $\text{Cu}_{0.05}\text{Co}_{0.3}\text{LiNi}_{0.7}\text{O}_{2.95}$ ) 856700-32-8, Lithium magnesium nickel oxide ( $\text{LiMg}_{0.05}\text{Co}_{0.3}\text{Ni}_{0.7}\text{O}_{2.95}$ ) 856700-33-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.34}\text{O}_2$ ) 856700-34-0 856700-35-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.4}\text{O}_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (lithium ion secondary battery)

L3 ANSWER 52 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:544051 CAPLUS  
 DOCUMENT NUMBER: 143:250877  
 TITLE: Influence of the synthesis route on the electrochemical properties of  $\text{LiNi}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15}\text{O}_2$   
 AUTHOR(S): Tran, N.; Croguennec, L.; Jordy, C.; Biensan, Ph.; Delmas, C.  
 CORPORATE SOURCE: Institut de Chimie de la Matiere Condensee de Bordeaux-CNRS, Ecole Nationale Supérieure de Chimie et Physique de Bordeaux, Université Bordeaux I, Pessac,

33608, Fr.  
 SOURCE: Solid State Ionics (2005), 176(17-18), 1539-1547  
 CODEN: SSIOD3; ISSN: 0167-2738  
 PUBLISHER: Elsevier B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 69 THERE ARE 69 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB LiNi<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.150</sub>2 has been synthesized by three different methods at 1000° for 12 h in air: (a) copptn. of a mixed nickel, manganese and cobalt hydroxide and then removal of the solvents by evaporation, (b) same precipitation conditions as (a) but the solvents were removed by freeze-drying, and (c) a mixed nickel, manganese and cobalt hydroxide was prepared by copptn. of the transition metal ions into lithium hydroxide only and, after washing and drying, the hydroxide was mixed with lithium carbonate and calcined at 1000° for 12 h in air. Chemical titrns., x-ray diffraction analyses by the Rietveld method and magnetic measurements showed that very similar overall chemical formula and cationic distributions were obtained for LiNi<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.150</sub>2 synthesized by the three different methods. However, scanning electron micrographs, particle size distribution and sp. surface area measurements showed textural differences in the three LiNi<sub>0.425</sub>Mn<sub>0.425</sub>Co<sub>0.150</sub>2 samples, which are believed to play a key role in the electrode preparation and thus to explain the differences observed in the electrochem. behavior in lithium battery.

ST cobalt lithium manganese nickel oxide synthesis electrochem property;  
 cathode cobalt lithium manganese nickel oxide battery

IT Battery cathodes  
 (influence of synthesis method on electrochem. properties of cobalt lithium manganese nickel oxide for use as cathode in lithium batteries)

IT 697766-76-0, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.15</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)  
 RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
 (influence of synthesis method on electrochem. properties of cobalt lithium manganese nickel oxide for use as cathode in lithium batteries)

L3 ANSWER 53 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:522751 CAPLUS

DOCUMENT NUMBER: 143:46047.

TITLE: Method and apparatus for charging secondary lithium battery and electric power supply device

INVENTOR(S): Iijima, Takeshi; Ogawa, Kazuya; Tanaka, Toshifumi; Maruyama, Akira

PATENT ASSIGNEE(S): TDK Corporation, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 27 pp.  
 CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005158285	A2	20050616	JP 2003-390858	20031120
JP 3795886	B2	20060712		

PRIORITY APPLN. INFO.: JP 2003-390858 20031120

TI Method and apparatus for charging secondary lithium battery and electric power supply device

AB The battery, having a cathode which contains a Li Mn Ni composite oxide active mass, an anode, and a Li salt-containing nonaq. electrolyte solution, is charged at a constant current which satisfies  $2C \leq nC \leq 60C$  ( $C$  = rated capacity; and  $n$  = 2-60). The apparatus has a power supply unit supplying elec. power to the battery and

a charging control unit controlling the power supply unit during charging and adjusting the charging rate of the battery. The power supply device contains the battery and the charging apparatus

ST secondary lithium battery charging method app

IT Secondary batteries  
(lithium; methods and apps. for charging secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 872-36-6, Vinylene carbonate 7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate 39302-37-9, Lithium titanium oxide 193215-51-9, Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.3</sub>Ni<sub>0.55</sub>O<sub>2</sub>) 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 532934-40-0, Cobalt lithium manganese nickel oxide (Co<sub>0.16</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (methods and apps. for charging secondary lithium batteries)

L3 ANSWER 54 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:508579 CAPLUS

DOCUMENT NUMBER: 143:214234

TITLE: Role of Alumina Coating on Li-Ni-Co-Mn-O Particles as Positive Electrode Material for Lithium-Ion Batteries

AUTHOR(S): Myung, Seung-Taek; Izumi, Kentarou; Komaba, Shinichi; Sun, Yang-Kook; Yashiro, Hitoshi; Kumagai, Naoaki

CORPORATE SOURCE: Department of Frontier Materials and Functional Engineering, Graduate School of Engineering, Iwate University, Iwate, Morioka, 020-8551, Japan

SOURCE: Chemistry of Materials (2005), 17(14), 3695-3704  
 CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Role of Alumina Coating on Li-Ni-Co-Mn-O Particles as Positive Electrode Material for Lithium-Ion Batteries

AB The interface reaction between Al<sub>2</sub>O<sub>3</sub>-coated Li[Li<sub>0.05</sub>Ni<sub>0.4</sub>Co<sub>0.15</sub>Mn<sub>0.4</sub>]O<sub>2</sub> and a liquid electrolyte was studied. The Al<sub>2</sub>O<sub>3</sub>-coated Li[Li<sub>0.05</sub>Ni<sub>0.4</sub>Co<sub>0.15</sub>Mn<sub>0.4</sub>]O<sub>2</sub> showed no large difference in bulk structure, compared to bare Li[Li<sub>0.05</sub>Ni<sub>0.4</sub>Co<sub>0.15</sub>Mn<sub>0.4</sub>]O<sub>2</sub>. The coated Al<sub>2</sub>O<sub>3</sub> has an amorphous structure according to XRD results. A small amount of Al<sub>2</sub>O<sub>3</sub> coating (0.25% in the final composition) showed a uniform mesoporous Al<sub>2</sub>O<sub>3</sub>-coating layer whose thickness is .apprx.5 nm covers Li[Li<sub>0.05</sub>Ni<sub>0.4</sub>Co<sub>0.15</sub>Mn<sub>0.4</sub>]O<sub>2</sub> particles, as confirmed by TEM. At higher concentration (2.5% in the final composition), irregular, tens of nanometer-sized Al<sub>2</sub>O<sub>3</sub> powder was observed on the surface of the active material, instead of the uniform coating layer. Despite the insulating nature of Al<sub>2</sub>O<sub>3</sub>, the thin coating was effective to improve battery performance, depending on the thickness of the Al<sub>2</sub>O<sub>3</sub>-coating layer, and the electrolytic salt used. The Al<sub>2</sub>O<sub>3</sub> coating resulted in a higher capacity retention, especially at 60°. The alumina layer protected against HF attack from the electrolyte during cycling so that the decomposition of active material from HF attack was suppressed. The lower impedance was ascribed to the pos. effects on the electrode/electrolyte interface, the less amount of decomposition of active material by HF and/or scavenging of HF by the Al<sub>2</sub>O<sub>3</sub>-coating layer into the electrolyte. These effects made it possible to maintain the morphol. of the active material during extensive cycling. The bare particles however were severely degraded by cycling, due to HF.

ST alumina coated cobalt lithium manganese nickel oxide cathode battery

IT Secondary batteries  
(lithium; role of alumina coating on cobalt lithium manganese nickel oxide cathode material for lithium-ion batteries)

IT Battery cathodes  
(role of alumina coating on cobalt lithium manganese nickel oxide



cathode material for lithium-ion batteries)

IT 862366-00-5, Cobalt lithium manganese nickel oxide  
(Co<sub>0.15</sub>Li<sub>1.05</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 862366-01-6, Cobalt lithium manganese  
nickel oxide (Co<sub>0.15</sub>Li<sub>0.38</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 862366-02-7, Cobalt  
lithium manganese nickel oxide (Co<sub>0.15</sub>Li<sub>0.43</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
862366-03-8, Cobalt lithium manganese nickel oxide  
(Co<sub>0.15</sub>Li<sub>0.48</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 862366-04-9, Cobalt lithium manganese  
nickel oxide (Co<sub>0.15</sub>Li<sub>0.58</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 862366-05-0, Cobalt  
lithium manganese nickel oxide (Co<sub>0.15</sub>Li<sub>0.68</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
862366-06-1, Cobalt lithium manganese nickel oxide  
(Co<sub>0.15</sub>Li<sub>0.78</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 862366-07-2, Cobalt lithium manganese  
nickel oxide (Co<sub>0.15</sub>Li<sub>0.88</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 862366-08-3, Cobalt  
lithium manganese nickel oxide (Co<sub>0.15</sub>Li<sub>0.98</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(alumina-coated; role of alumina coating on cobalt lithium manganese  
nickel oxide cathode material for lithium-ion batteries)

IT 1344-28-1, Alumina, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)  
(cobalt lithium manganese nickel oxide coated with; role of alumina  
coating on cobalt lithium manganese nickel oxide cathode material for  
lithium-ion batteries)

L3 ANSWER 55 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:493821 CAPLUS

DOCUMENT NUMBER: 143:29509

TITLE: Process and reactor for preparation of cathode active  
material for lithium secondary battery

INVENTOR(S): Sun, Yang Kook; Lee, Myoung Hun; Kang, Yoon Jung; Kim,  
Gil Ho

PATENT ASSIGNEE(S): Hanyang Hak Won Co., Ltd., S. Korea

SOURCE: PCT Int. Appl., 32 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005053064	A1	20050609	WO 2004-KR2980	20041117
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2004007356	A	20040124	KR 2003-84702	20031126
PRIORITY APPLN. INFO.:			KR 2003-84702	A 20031126
REFERENCE COUNT:	3	THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		

TI Process and reactor for preparation of cathode active material for lithium  
secondary battery

AB The invention relates to a cathode active material for a lithium secondary  
battery and a process for preparing the same. In accordance with the  
present invention, the cathode active material having a high packing d.  
was designed and synthesized and thus provided is a cathode active  
material for a lithium secondary battery exhibiting structural  
stability such as improved characteristics for charge/discharge, service  
life and high-rate and thermal stability, by modifying surface of the  
electrode active material with amphoteric or basic compds. capable of

neutralizing acid produced around the cathode active material.

ST cathode active material prepn lithium secondary battery

IT Secondary batteries  
(lithium; process and reactor for preparation of cathode active material for lithium secondary battery)

IT Battery cathodes  
(process and reactor for preparation of cathode active material for lithium secondary battery)

IT Carbon black, uses  
Fluoropolymers, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(process and reactor for preparation of cathode active material for lithium secondary battery)

IT 113066-89-0P, Cobalt lithium nickel oxide (Co<sub>0.2</sub>LiNi<sub>0.8</sub>O<sub>2</sub>) 128975-24-6P,  
Lithium manganese nickel oxide LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub> 193215-96-2P,  
Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
346417-97-8P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 837287-95-3P 852875-92-4P 852875-93-5P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(process and reactor for preparation of cathode active material for lithium secondary battery)

IT 24937-79-9, PvdF  
RL: MOA (Modifier or additive use); USES (Uses)  
(process and reactor for preparation of cathode active material for lithium secondary battery)

L3 ANSWER 56 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:493050 CAPLUS

DOCUMENT NUMBER: 143:29495

TITLE: Cathode active mass for secondary lithium battery, its manufacture, and the battery

INVENTOR(S): Nakajima, Motoe; Inada, Fumi; Uchikawa, Akio

PATENT ASSIGNEE(S): Hitachi Metals, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005150102	A2	20050609	JP 2004-306421	20041021
PRIORITY APPLN. INFO.:			JP 2003-364436	A 20031024

TI Cathode active mass for secondary lithium battery, its manufacture, and the battery

ST secondary battery lithium transition metal oxide manuf atm humidity; particle size lithium transition metal oxide battery cathode

IT Battery cathodes  
(comps. and medium particle size of lithium transition metal oxides and their manufacture for secondary lithium battery cathodes)

IT 787635-96-5P, Cobalt lithium manganese nickel oxide (Co<sub>0.31</sub>Li<sub>1.08</sub>Mn<sub>0.33</sub>Ni<sub>0.36</sub>O<sub>2</sub>) 787635-97-6P, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>Li<sub>1.08</sub>Mn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 787635-98-7P, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.08</sub>Mn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 787635-99-8P 787636-00-4P 787636-01-5P, Aluminum lithium manganese nickel oxide (Al<sub>0.1</sub>Li<sub>1.08</sub>Mn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 852996-06-6P, Lithium manganese nickel oxide (Li<sub>1.08</sub>Mn<sub>0.3</sub>Ni<sub>0.7</sub>O<sub>2</sub>)

RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); PREP (Preparation); USES (Uses)

(comps. and medium particle size of lithium transition metal oxides and their manufacture for secondary lithium battery cathodes)

L3 ANSWER 57 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:370911 CAPLUS  
 DOCUMENT NUMBER: 142:414564  
 TITLE: Electrochemical energy storage device  
 INVENTOR(S): Arai, Juichi; Kumashiro, Yoshiaki; Kobayasi, Mituru  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005089728	A1	20050428	US 2004-785992	20040226
JP 2005129446	A2	20050519	JP 2003-365961	20031027
WO 2005041343	A1	20050506	WO 2004-JP8853	20040617

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: JP 2003-365961 A 20031027  
 ST battery electrochem energy storage device  
 IT Secondary batteries  
 (electrochem. energy storage device)  
 IT 193215-96-2P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (electrochem. energy storage device)

L3 ANSWER 58 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:370194 CAPLUS  
 DOCUMENT NUMBER: 143:62545  
 TITLE: Factors influencing the lithium extraction rate in layered oxide cathodes of lithium ion cells  
 AUTHOR(S): Manthiram, A.; Choi, J.  
 CORPORATE SOURCE: Materials Science and Engineering Program, The University of Texas at Austin, Austin, TX, 78712, USA  
 SOURCE: Materials Research Society Symposium Proceedings (2005), Volume Date 2004, 835(Solid State Ionics--2004), 291-296  
 CODEN: MRSPDH; ISSN: 0272-9172  
 PUBLISHER: Materials Research Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST lithium extn layered oxide cathode lithium battery  
 IT Materials  
 (layered; lithium extraction from layered oxide cathode material for lithium batteries)  
 IT Battery cathodes  
 (lithium extraction from layered oxide cathode material for lithium batteries)  
 IT Secondary batteries  
 (lithium; lithium extraction from layered oxide cathode material for lithium batteries)

IT Intercalation  
(retro, electrochem.; lithium extraction from layered oxide cathode material for lithium batteries)

IT 13826-86-3, Nitronium fluoroborate (NO<sub>2</sub>BF<sub>4</sub>)  
RL: NUU (Other use, unclassified); USES (Uses)  
(in lithium extraction from layered oxide cathode material for lithium batteries)

IT 7439-93-2, Lithium, processes  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(lithium extraction from layered oxide cathode material for lithium batteries)

IT 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 128975-24-6, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 390362-01-3, Cobalt lithium manganese nickel oxide (Co<sub>0.5</sub>LiMn<sub>0.25</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 405890-05-3, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 459408-76-5, Cobalt lithium manganese nickel oxide (Co<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 697766-76-0, Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>) 781672-38-6, Cobalt lithium manganese nickel oxide (Co<sub>0.58</sub>LiMn<sub>0.21</sub>Ni<sub>0.21</sub>O<sub>2</sub>) 854546-03-5, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.34</sub>Ni<sub>0.34</sub>O<sub>2</sub>) 854546-04-6, Cobalt lithium manganese nickel oxide (Co<sub>0.41</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>)  
RL: NUU (Other use, unclassified); USES (Uses)  
(lithium extraction from layered oxide cathode material for lithium batteries)

L3 ANSWER 59 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2005:370192 CAPLUS  
DOCUMENT NUMBER: 143:62543  
TITLE: Structural and electrochemical properties of  
LiMn<sub>0.4</sub>Ni<sub>0.4</sub>Co<sub>0.2</sub>O<sub>2</sub>  
AUTHOR(S): Ma, Miaomiao; Chernova, Natasha A.; Zavalij, Peter Y.;  
Whittingham, M. Stanley  
CORPORATE SOURCE: Materials Science, State University of New York at  
Binghamton, Binghamton, NY, 13902, USA  
SOURCE: Materials Research Society Symposium Proceedings  
(2005), Volume Date 2004, 835(Solid State  
Ionics--2004), 279-284  
CODEN: MRSPDH; ISSN: 0272-9172  
PUBLISHER: Materials Research Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode lithium battery

IT Secondary batteries  
(lithium; structural and electrochem. properties of LiMn<sub>0.4</sub>Ni<sub>0.4</sub>Co<sub>0.2</sub>O<sub>2</sub> cathode material for lithium batteries)

IT Crystal structure  
(of LiMn<sub>0.4</sub>Ni<sub>0.4</sub>Co<sub>0.2</sub>O<sub>2</sub> cathode material for lithium batteries)

IT Battery cathodes  
(structural and electrochem. properties of LiMn<sub>0.4</sub>Ni<sub>0.4</sub>Co<sub>0.2</sub>O<sub>2</sub> cathode material for lithium batteries)

IT 193215-96-2, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(structural and electrochem. properties of LiMn<sub>0.4</sub>Ni<sub>0.4</sub>Co<sub>0.2</sub>O<sub>2</sub> cathode material for lithium batteries)

IT 128975-24-6, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
532934-38-6, Cobalt lithium manganese nickel oxide  
(Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
(structural and electrochem. properties of LiMn<sub>0.4</sub>Ni<sub>0.4</sub>Co<sub>0.2</sub>O<sub>2</sub> cathode material for lithium batteries)

L3 ANSWER 60 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:370191 CAPLUS  
 DOCUMENT NUMBER: 143:62542  
 TITLE: Structure and electrochemical performances of the  
 $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$  materials  
 AUTHOR(S): Tran, N.; Croguennec, L.; Weill, F.; Jordy, C.;  
 Biensan, P.; Delmas, C.  
 CORPORATE SOURCE: Institut de Chimie de la Matiere Condensee de Bordeaux  
 (ICMCB-CNRS) and Ecole Nationale Supérieure de Chimie  
 et Physique de Bordeaux (ENSCP), Université Bordeaux  
 1, Pessac, 33608, Fr.  
 SOURCE: Materials Research Society Symposium Proceedings  
 (2005), Volume Date 2004, 835(Solid State  
 Ionics--2004), 273-278  
 CODEN: MRSPDH; ISSN: 0272-9172  
 PUBLISHER: Materials Research Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode lithium battery  
 IT Secondary batteries  
 (lithium; structure and electrochem. performance of  
 $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$  cathode material for lithium  
 batteries)  
 IT Crystal structure  
 (of  $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$  cathode material for lithium  
 batteries)  
 IT Battery cathodes  
 (structure and electrochem. performance of  $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$   
 cathode material for lithium batteries)  
 IT 697766-76-0, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.15}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 854736-23-5, Cobalt lithium manganese nickel  
 oxide ( $\text{Co}_{0.13}\text{Li}_{1.12}\text{Mn}_{0.37}\text{Ni}_{0.37}\text{O}_2$ )  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (structure and electrochem. performance of  $\text{Li}_{1+x}(\text{Ni}_{0.425}\text{Mn}_{0.425}\text{Co}_{0.15})_{1-x}\text{O}_2$   
 cathode material for lithium batteries)

L3 ANSWER 61 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:339295 CAPLUS  
 DOCUMENT NUMBER: 142:484698  
 TITLE: Preparation and performance of cathode material  
 $\text{LiNi}_{0.45}\text{Co}_{0.1}\text{Mn}_{0.45}\text{O}_2$   
 AUTHOR(S): Li, Peng; Han, En-Shan; Tan, Bai-Shan; Xu, Hai-Jiang  
 CORPORATE SOURCE: Dep. Appl. Chem., Hebei Univ. Technol., Tianjin,  
 300130, Peop. Rep. China  
 SOURCE: Yingyong Huaxue (2005), 22(3), 304-307  
 CODEN: YIHUED; ISSN: 1000-0518  
 PUBLISHER: Kexue Chubanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

AB The title cathode material for lithium-ion batteries was prepared  
 by the sol-gel method and investigated by means of phys. and electrochem.  
 methods as the function of preparation conditions. Its structure and elec.  
 behavior were characterized and measured by x-ray diffraction technique,  
 DSC, cyclic voltammetry, and constant-current charge-discharge tests. The  
 results show that  $\text{LiNi}_{0.45}\text{Co}_{0.5}\text{Mn}_{0.45}\text{O}_2$  obtained by calcination at  
 700° for 7 h exhibited a sp. discharge capacity up to 145 mA-h/g  
 after 30 charge-discharge cycles at 3.0-4.3 V.

ST cobalt lithium manganese nickel oxide cathode prepn; battery  
 cobalt lithium manganese nickel oxide cathode  
 IT Battery cathodes  
 (preparation and performance of cobalt lithium manganese nickel oxide  
 cathode material for lithium-ion batteries)  
 IT 405890-05-3, Cobalt lithium manganese nickel oxide

(Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>)

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(preparation and performance of cobalt lithium manganese nickel oxide cathode material for lithium-ion batteries)

L3 ANSWER 62 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:323493 CAPLUS

DOCUMENT NUMBER: 142:395061

TITLE: Cathode material for secondary nonaqueous battery, its manufacture, and the battery using the material

INVENTOR(S): Hisayoshi, Kanji; Watarai, Yusuke

PATENT ASSIGNEE(S): Mitsubishi Materials Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	JP 2005100947	A2	20050414	JP 2004-206622	20040714
PRIORITY APPLN. INFO.:				JP 2003-208171	A 20030821
TI	Cathode material for secondary nonaqueous battery, its manufacture, and the battery using the material				
AB	The cathode material is a layer structured Li-Mn-Ni-Co composite oxide: Li[Li(1-2x-y)/3NixCoyMn(2-x-2y)/3] (0.2 < x < 0.5; 0 < y < 0.2; and 2x+y > 1). The cathode material is manufactured by reacting an aqueous solution of a Ni salt, a Co salt, and a Mn salt with a strong alkali aqueous solution to obtain a Ni-Co-Mn hydroxide; oxidizing the hydroxide to obtain a Ni-Co-Mn oxyhydroxide; mixing the oxyhydroxide with a Li compound to obtain a raw material mixture; and firing the mixture in atmospheric to obtain a Li transition metal oxide. The battery uses the above cathode material.				
ST	secondary battery cathode lithium manganese nickel cobalt oxide manuf				
IT	Battery cathodes (compsn. and manufacture of cathode materials containing lithium manganese cobalt nickel oxides for secondary lithium batteries)				
IT	Secondary batteries (lithium; comps. and manufacture of cathode materials containing lithium manganese cobalt nickel oxides for secondary lithium batteries)				
IT	845929-86-4P, Cobalt lithium manganese nickel oxide (Co <sub>0.15</sub> Li <sub>1.05</sub> Mn <sub>0.45</sub> Ni <sub>0.35</sub> O <sub>2</sub> ) 849803-52-7P, Cobalt lithium manganese nickel oxide (Co <sub>0.05</sub> Li <sub>1.08</sub> Mn <sub>0.52</sub> Ni <sub>0.35</sub> O <sub>2</sub> ) 849803-54-9P, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> Li <sub>1.07</sub> Mn <sub>0.48</sub> Ni <sub>0.35</sub> O <sub>2</sub> ) 849803-55-0P, Cobalt lithium manganese nickel oxide (Co <sub>0.05</sub> Li <sub>1.15</sub> Mn <sub>0.55</sub> Ni <sub>0.25</sub> O <sub>2</sub> ) 849803-56-1P, Cobalt lithium manganese nickel oxide (Co <sub>0.05</sub> Li <sub>1.05</sub> Mn <sub>0.58</sub> Ni <sub>0.40</sub> O <sub>2</sub> ) RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (compsn. and manufacture of cathode materials containing lithium manganese cobalt nickel oxides for secondary lithium batteries)				

L3 ANSWER 63 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:300808 CAPLUS

DOCUMENT NUMBER: 142:376498

TITLE: Method for regulating terminal voltage of cathode during overdischarge and cathode active material for lithium secondary battery

INVENTOR(S): Chang, Sung-kyun; Hong, Seung-tae; Kim, Hyeong-jin; Ryu, Duk-hyun; Goh, Eun-young; Lee, Ho-chun; Jeong, Jun-yong; Yeon, Jin-hee

PATENT ASSIGNEE(S): Lg Chem, Ltd., S. Korea

SOURCE: PCT Int. Appl., 47 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005031892	A2	20050407	WO 2004-KR2461	20040924
WO 2005031892	A3	20050602		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2005030588	A	20050330	KR 2004-76778	20040924
CN 1745490	A	20060308	CN 2004-80003043	20040924
JP 2006514776	T2	20060511	JP 2005-518284	20040924
EP 1665420	A2	20060607	EP 2004-774711	20040924
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				
PRIORITY APPLN. INFO.:			KR 2003-66865	A 20030926
			KR 2003-66866	A 20030926
			WO 2004-KR2461	W 20040924
TI	Method for regulating terminal voltage of cathode during overdischarge and cathode active material for lithium secondary battery			
AB	Disclosed is a method for regulating terminal voltage of a cathode during overdischarge. Also disclosed is a lithium secondary battery, which is low in capacity loss after overdischarge, having excellent capacity restorability after overdischarge and shows an effect of preventing a battery from swelling at a high temperature			
ST	lithium secondary battery cathode active material			
IT	Transition metal oxides			
	RL: DEV (Device component use); USES (Uses) (lithium-containing; method for regulating terminal voltage of cathode during overdischarge and cathode active material for lithium secondary battery)			
IT	Secondary batteries			
	(lithium; method for regulating terminal voltage of cathode during overdischarge and cathode active material for lithium secondary battery)			
IT	Battery cathodes			
	Electric potential			
	(method for regulating terminal voltage of cathode during overdischarge and cathode active material for lithium secondary battery)			
IT	96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7791-03-9, Lithium perchlorate 12057-17-9, Lithium manganese oxide (LiMn2O4) 12162-79-7, Lithium manganese oxide limno2 12190-79-3, Cobalt lithium oxide (CoLiO2) 13824-63-0, Cobalt lithium phosphate colipo4 14283-07-9, Lithium tetrafluoroborate 15365-14-7, Iron lithium phosphate felipo4 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9, Methyl propyl carbonate 90076-65-6 135573-53-4, Cobalt lithium nickel oxide co0-11ini0-1o2 188651-74-3, Cobalt lithium manganese oxide ((Co,Mn)2LiO4) 188651-75-4, Lithium manganese nickel oxide (Li(Mn,Ni)2O4) 214536-41-1, Cobalt lithium manganese oxide 607706-67-2, Cobalt lithium manganese nickel oxide			

((Co,Mn,Ni)LiO2) 607706-68-3, Cobalt lithium manganese nickel oxide  
((Co,Mn,Ni)2LiO4)

RL: DEV (Device component use); USES (Uses)

(method for regulating terminal voltage of cathode during overdischarge  
and cathode active material for lithium secondary battery)

IT 555-31-7, Aluminum isopropoxide 2171-98-4, Zirconium isopropoxide  
12325-84-7, Lithium nickel oxide (Li2NiO2) 39300-70-4, Lithium nickel  
oxide 39336-10-2, Iron lithium nickel oxide 51177-05-0, Chromium  
lithium nickel oxide 59977-40-1, Lithium nickel strontium oxide  
131344-56-4, Cobalt lithium nickel oxide 152991-98-5, Aluminum lithium  
nickel oxide 159967-11-0, Lithium magnesium nickel oxide 162684-16-4,  
Lithium manganese nickel oxide 163294-87-9, Lithium nickel vanadium  
oxide 180984-62-7, Lithium nickel titanium oxide 191538-05-3, Copper  
lithium nickel oxide 197389-21-2, Aluminum lithium nickel oxide  
(Al0.03LiNi0.97O2) 207986-09-2, Lithium magnesium nickel oxide  
(LiMg0.03Ni0.97O2) 249756-69-2, Boron lithium nickel oxide  
635316-63-1, Lithium nickel carbonate oxide 656812-51-0, Lithium nickel  
zinc oxide 656812-52-1, Lithium nickel zirconium oxide 656812-53-2,  
Lithium nickel niobium oxide 656812-54-3, Lithium molybdenum nickel  
oxide 849341-90-8, Lithium nickel scandium oxide 849341-91-9, Cadmium  
lithium nickel oxide 849341-92-0, Lithium nickel borate oxide  
(Li2Ni0.97(BO3)0.03O1.91)

RL: MOA (Modifier or additive use); USES (Uses)

(method for regulating terminal voltage of cathode during overdischarge  
and cathode active material for lithium secondary battery)

L3 ANSWER 64 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:250643 CAPLUS

DOCUMENT NUMBER: 142:466364

TITLE: Reactivity of Liy[NixCol-2xMnx]O2 (x = 0.1, 0.2, 0.35,  
0.45, and 0.5; y = 0.3, 0.5) with nonaqueous solvents  
and electrolytes studied by ARC

AUTHOR(S): Jiang, J.; Eberman, K. W.; Krause, L. J.; Dahn, J. R.

CORPORATE SOURCE: Department of Chemistry, Dalhousie University,  
Halifax, NS, B3H 3J5, Can.

SOURCE: Journal of the Electrochemical Society (2005), 152(3),  
A566-A569

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode reactivity lithium  
battery

IT Secondary batteries

(lithium; reactivity of LiNixCol-2xMnxO2 cathode material for lithium  
batteries with nonaq. solvents and electrolytes)

IT Battery cathodes

Reactivity (chemical)

(reactivity of LiNixCol-2xMnxO2 cathode material for lithium  
batteries with nonaq. solvents and electrolytes)

IT Calorimetry

(reactivity of LiNixCol-2xMnxO2 cathode material for lithium  
batteries with nonaq. solvents and electrolytes studied by ARC)

IT 21324-40-3, Lithium hexafluorophosphate (LiPF6)

RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)

(electrolyte; reactivity of LiNixCol-2xMnxO2 cathode material for  
lithium batteries with nonaq. solvents and electrolytes)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 128975-24-6,  
Lithium manganese nickel oxide (LiMn0.5Ni0.5O2) 170110-41-5, Cobalt  
lithium manganese nickel oxide (Co0.6LiMn0.2Ni0.2O2) 227623-80-5, Cobalt  
lithium manganese nickel oxide (Co0.8LiMn0.1Ni0.1O2) 405890-05-3  
, Cobalt lithium manganese nickel oxide (Co0.1LiMn0.45Ni0.45O2)



493394-61-9, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.35</sub>Ni<sub>0.35</sub>O<sub>2</sub>)  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)

(reactivity of LiNi<sub>x</sub>Co<sub>1-2x</sub>Mn<sub>x</sub>O<sub>2</sub> cathode material for lithium  
batteries with nonaq. solvents and electrolytes)

L3 ANSWER 65 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:219682 CAPLUS

DOCUMENT NUMBER: 142:264437

TITLE: Preparation of lithium transition metals oxides from  
carbonate precursors and their use as cathode material

INVENTOR(S): Liu, Huiquan; Wang, Chuanfu

PATENT ASSIGNEE(S): Peop. Rep. China

SOURCE: U.S. Pat. Appl. Publ., 6 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 7

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2005053545	A1	20050310	US 2003-717236	20031119
CN 1500732	A	20040602	CN 2002-151991	20021119
US 2004223906	A1	20041111	US 2004-841760	20040508
US 2005037263	A1	20050217	US 2004-918580	20040813
PRIORITY APPLN. INFO.:			CN 2002-151991	A 20021119
			CN 2003-126555	A 20030509
			CN 2003-139607	A 20030623
			CN 2003-140196	A 20030815
			CN 2003-140216	A 20030815
			US 2003-717236	A2 20031119
			US 2003-733018	A2 20031210
			US 2004-770630	A2 20040202
			US 2004-823931	A2 20040414
			US 2004-841760	A2 20040508
ST	carbonate precursor lithium transition metal oxide prepn cathode battery			
IT	Secondary batteries (lithium; preparation of lithium transition metals oxides from carbonate precursors and their use as cathode material)			
IT	Battery cathodes (preparation of lithium transition metals oxides from carbonate precursors and their use as cathode material)			
IT	182442-95-1P, Cobalt lithium manganese nickel oxide 193215-96-2P , Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.4</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) RL: CPS (Chemical process); DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses) (cathode material; preparation of lithium transition metals oxides from carbonate precursors and their use as cathode material)			

L3 ANSWER 66 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:57650 CAPLUS

DOCUMENT NUMBER: 142:159501

TITLE: Lithium secondary battery

INVENTOR(S): Akabane, Naoto; Wada, Shuichi; Toshiro, Hiroyuki

PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005019149	A2	20050120	JP 2003-181330	20030625
PRIORITY APPLN. INFO.:			JP 2003-181330	20030625

TI Lithium secondary battery  
 AB The battery has a cathode, containing a 1st Li Mn Ni composite oxide:  $\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)}/2\text{Mn}_{(1-x-y-\delta)}\text{O}_2$  (M = Cr, Fe, Co, and/or Al;  $x = 0-0.1$ ;  $y = 0-0.4$ ;  $\alpha = -0.05-0.05$ ; and  $\delta = -0.1-0.1$ ) and a 2nd Li Co composite oxide:  $\text{Li}_x\text{CoO}_2$  ( $x = 0.98-1.02$ ); where the mass ratio of the 1st oxide to the 2nd oxide is  $\leq 50$  mass%. and the average particle of the 1st oxide is  $\leq 1/2$  of the 2nd oxide.  
 ST secondary lithium battery cathode lithium manganese nickel composite oxide; battery cathode lithium cobalt composite oxide  
 IT Battery cathodes  
 (cathodes containing lithium manganese nickel composite oxides and lithium cobalt composite oxides for secondary lithium batteries)  
 IT Secondary batteries  
 (lithium; cathodes containing lithium manganese nickel composite oxides and lithium cobalt composite oxides for secondary lithium batteries)  
 IT 12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 128975-24-6, Lithium manganese nickel oxide ( $\text{LiMn}_0.5\text{Ni}_0.5\text{O}_2$ ) 493326-93-5, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.33\text{LiMn}_0.34\text{Ni}_0.33\text{O}_2$ ) 532934-40-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.16\text{LiMn}_0.42\text{Ni}_0.42\text{O}_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (cathodes containing lithium manganese nickel composite oxides and lithium cobalt composite oxides for secondary lithium batteries)

L3 ANSWER 67 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:1149397 CAPLUS  
 DOCUMENT NUMBER: 142:264289  
 TITLE: Layered  $(1-x-y)\text{LiNi}_{1/2}\text{Mn}_{1/2}\text{O}_2 \cdot x\text{Li}[\text{Li}_{1/3}\text{Mn}_{2/3}\text{O}_2 \cdot y\text{LiCoO}_2]$  ( $0 \leq x=y \leq 0.3$  and  $x+y=0.5$ ) Cathode Materials  
 AUTHOR(S): Zhang, Lianqi; Takada, Kazunori; Ohta, Narumi; Fukuda, Katsutoshi; Osada, Minoru; Wang, Lianzhou; Sasaki, Takayoshi; Watanabe, Mamoru  
 CORPORATE SOURCE: Advanced Materials Laboratory, National Institute for Materials Science, Tsukuba, Ibaraki, 305-0044, Japan  
 SOURCE: Journal of the Electrochemical Society (2005), 152(1), A171-A178  
 CODEN: JESOAN; ISSN: 0013-4651  
 PUBLISHER: Electrochemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST layered alkali metal transition metal oxide lithium battery cathode; lithium secondary battery cathode material layered crystal electrochem cycling  
 IT Electric capacitance  
 (charge-discharge capacity vs. voltage of assembled batteries ; of layered lithium manganese nickel oxides)  
 IT Secondary batteries  
 (lithium; of layered lithium manganese nickel oxides)  
 IT Battery cathodes  
 (materials for; crystal structure, discharge capacity, and electrochem.)  
 IT 845929-85-3P, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.05\text{Li}_{1.02}\text{Mn}_{0.48}\text{Ni}_{0.45}\text{O}_2$ )  
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 ( $x=y=0.05$ ; crystal structure, discharge capacity, and electrochem.)  
 IT 845929-84-2P, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.1\text{Li}_{1.03}\text{Mn}_{0.47}\text{Ni}_{0.4}\text{O}_2$ )  
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic

preparation); PREP (Preparation); USES (Uses)  
(x=y=0.1; crystal structure, discharge capacity, and electrochem.)

L3 ANSWER 68 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:1080129 CAPLUS  
DOCUMENT NUMBER: 142:59721  
TITLE: Cathode active mass for secondary lithium  
battery, its manufacture, and the  
battery  
INVENTOR(S): Shiozaki, Ryuji; Fujii, Akihiro; Nukuta, Toshiyuki  
PATENT ASSIGNEE(S): Yuasa Corporation, Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2004355986	A2	20041216	JP 2003-153615	20030530
PRIORITY APPLN. INFO.:				JP 2003-153615	20030530
TI	Cathode active mass for secondary lithium battery, its manufacture, and the battery				
ST	secondary lithium battery cathode active mass manuf carbonaceous material; transition metal cathode active mass manuf secondary lithium battery				
IT	Battery cathodes (carbonaceous materials in manufacture of transition metal compound cathode active mass from aqueous solns. for secondary lithium batteries)				
IT	Carbon black, uses RL: NUU (Other use, unclassified); USES (Uses) (carbonaceous materials in manufacture of transition metal compound cathode active mass from aqueous solns. for secondary lithium batteries)				
IT	214473-76-4P, Cobalt lithium manganese nickel oxide (Co <sub>0.9</sub> LiMn <sub>0.05</sub> Ni <sub>0.05</sub> O <sub>2</sub> ) 227623-80-5P, Cobalt lithium manganese nickel oxide (Co <sub>0.8</sub> LiMn <sub>0.1</sub> Ni <sub>0.1</sub> O <sub>2</sub> ) 404904-11-6P, Cobalt lithium manganese nickel oxide (Co <sub>0.4</sub> LiMn <sub>0.3</sub> Ni <sub>0.3</sub> O <sub>2</sub> ) 632287-14-0P, Cobalt lithium manganese nickel oxide (Co <sub>0.02</sub> LiMn <sub>0.49</sub> Ni <sub>0.49</sub> O <sub>2</sub> ) RL: IMF (Industrial manufacture); PREP (Preparation) (carbonaceous materials in manufacture of transition metal compound cathode active mass from aqueous solns. for secondary lithium batteries)				

L3 ANSWER 69 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:1076998 CAPLUS  
DOCUMENT NUMBER: 142:41536  
TITLE: Secondary battery  
INVENTOR(S): Yamamoto, Akira  
PATENT ASSIGNEE(S): Sony Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 29 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2004356092	A2	20041216	JP 2004-134780	20040428
PRIORITY APPLN. INFO.:				JP 2003-127162	A 20030502
TI	Secondary battery				
AB	The battery, especially a secondary lithium battery, has an electrolyte, a cathode, and an anode, whose capacity is a sum of a capacity component by intercalation and decalation of a light metal and a capacity component by deposition and dissoln. of the light metal; where the cathode contains a composite oxide: LixM <sub>1</sub> 1-yM <sub>2</sub> yO <sub>2</sub> -z [M <sub>1</sub> = Co and/or				

Ni; M2 = metal element(s) whose atomic number  $\geq 11$  (excluding M1 element);  $1 < x < 1.35$ ;  $0 \leq y < 1.0$ ;  $z = -0.1-0.1$ ] or Li<sub>a</sub>Mn<sub>2</sub>-bM<sub>3</sub>bO<sub>4</sub>-d [M<sub>3</sub> = metal element(s) whose atomic number  $\geq 11$  (excluding Mn);  $1 < a < 1.35$ ;  $0 \leq b < 0.5$ ;  $z = -0.2-0.2$ ]. Preferably, the electrolyte contains tetrahydropyran, THF, 2-Me THF, 1,3-dioxolane, 1,2-diethoxy ethane, 1,3-dimethoxy ethane, and/or their derivs.

ST secondary battery cathode lithium manganese oxide lithium cobalt oxide

IT Battery cathodes  
(cathodes containing lithium transition metal composite oxides for secondary lithium batteries)

IT Secondary batteries  
(lithium; cathodes containing lithium transition metal composite oxides for secondary lithium batteries)

IT 96-47-9, 2-Methyl tetrahydrofuran 96-49-1, Ethylene carbonate 109-99-9, uses 110-71-4 142-68-7, Tetrahydropyrane 616-38-6, Dimethyl carbonate 646-06-0, 1,3-Dioxolane 132825-97-9, Lithium manganese oxide (Li<sub>1.15</sub>Mn<sub>2</sub>O<sub>4</sub>) 136574-96-4, Cobalt lithium oxide (CoLi<sub>1.15</sub>O<sub>2</sub>) 136574-97-5, Cobalt lithium oxide (CoLi<sub>1.2</sub>O<sub>2</sub>) 156098-40-7, Cobalt lithium oxide (CoLi<sub>1.05</sub>O<sub>2</sub>) 247565-42-0, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.05</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 263700-81-8, Cobalt lithium oxide (CoLi<sub>1.06</sub>O<sub>2</sub>) 807654-76-8, Cobalt lithium oxide (CoLi<sub>1.32</sub>O<sub>2</sub>) 807654-78-0, Aluminum lithium nickel oxide (Al<sub>0.05</sub>Li<sub>1.05</sub>Ni<sub>0.95</sub>O<sub>2</sub>) 807654-80-4, Aluminum lithium nickel oxide (Al<sub>0.05</sub>Li<sub>1.06</sub>Ni<sub>0.95</sub>O<sub>2</sub>) 807654-83-7, Aluminum lithium nickel oxide (Al<sub>0.05</sub>Li<sub>1.15</sub>Ni<sub>0.95</sub>O<sub>2</sub>) 807654-86-0, Aluminum lithium nickel oxide (Al<sub>0.05</sub>Li<sub>1.2</sub>Ni<sub>0.95</sub>O<sub>2</sub>) 807654-89-3, Aluminum lithium nickel oxide (Al<sub>0.05</sub>Li<sub>1.32</sub>Ni<sub>0.95</sub>O<sub>2</sub>) 807654-92-8, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.06</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 807654-96-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.15</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 807654-99-5, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.2</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 807655-02-3, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.32</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 807655-05-6 807655-08-9 807655-11-4 807655-13-6 807655-15-8 807655-17-0, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>Li<sub>1.15</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 807655-19-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.15</sub>Mn<sub>0.35</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 807655-21-6, Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>Li<sub>1.15</sub>Mn<sub>0.2</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 807655-23-8, Cobalt lithium manganese nickel oxide (Co<sub>0.6</sub>Li<sub>1.15</sub>Mn<sub>0.2</sub>Ni<sub>0.2</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)  
(cathodes containing lithium transition metal composite oxides for secondary lithium batteries)

L3 ANSWER 70 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:1059702 CAPLUS

DOCUMENT NUMBER: 142:25916

TITLE: Lithium metal oxide cathodes for nonaqueous lithium batteries

INVENTOR(S): Whitfield, Pamela; Davidson, Isobel

PATENT ASSIGNEE(S): National Research Council of Canada, Can.

SOURCE: PCT Int. Appl., 32 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004107480	A2	20041209	WO 2004-CA770	20040527
WO 2004107480	A3	20051103		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,			

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,  
 AZ, BY, KG, KZ, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,  
 EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,  
 SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
 SN, TD, TG

CA 2527207 AA 20041209 CA 2004-2527207 20040527  
 EP 1629553 A2 20060301 EP 2004-734982 20040527  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR  
 CN 1795574 A 20060628 CN 2004-80014805 20040527  
 PRIORITY APPLN. INFO.: US 2003-473476P P 20030528  
 WO 2004-CA770 W 20040527

TI Lithium metal oxide cathodes for nonaqueous lithium batteries  
 AB A lithium metal oxide pos. electrode for a non-aqueous lithium cell or  
 battery is disclosed. The pos. electrode comprises a lithium  
 metal oxide having a layered structure and a general formula, after  
 in-situ or ex-situ oxidation, of  $\text{Li}_x\text{Mn}_y\text{M}_1-\text{yO}_2$  wherein  $0 \leq x \leq$   
 $0.20$ ,  $0 < y < 1$ , manganese is in the 4+ oxidation state, and M is one or more  
 the first row transition metals: Ti, V, Cr, Mn, Fe, Co, Ni or Cu, or other  
 specific other canons: Al, Mg, Mo, W, Ta, Si, Sn, Zr, Be, Ca, Ga, and P,  
 which have an appropriate ionic radii to be inserted in to the structure  
 without unduly disrupting it. Usage of the materials of the invention in  
 lithium cells and batteries is disclosed. A process is  
 disclosed for formation of materials of the invention.  
 ST lithium metal oxide cathode nonaq lithium battery  
 IT Battery cathodes  
 (lithium metal oxide cathodes for nonaq. lithium batteries)  
 IT Secondary batteries  
 (lithium; lithium metal oxide cathodes for nonaq. lithium  
 batteries)  
 IT 53027-29-5, Iron lithium manganese oxide 61179-01-9, Aluminum lithium  
 manganese oxide 133782-19-1, Lithium manganese vanadium oxide  
 138758-08-4, Lithium manganese phosphorus oxide 153327-00-5, Gallium  
 lithium manganese oxide 153327-05-0, Lithium manganese tin oxide  
 162684-16-4, Lithium manganese nickel oxide 175786-46-6, Lithium  
 magnesium manganese oxide 191538-04-2, Copper lithium manganese oxide  
 201534-12-5, Lithium manganese zirconium oxide 204450-96-4, Chromium  
 lithium manganese oxide 208394-04-1, Lithium manganese titanium oxide  
 208394-05-2, Lithium manganese molybdenum oxide 214536-41-1, Cobalt  
 lithium manganese oxide 245085-55-6, Calcium lithium manganese oxide  
 252568-43-7, Lithium manganese tungsten oxide 252568-44-8, Lithium  
 manganese silicon oxide 393802-01-2, Beryllium lithium manganese oxide  
 393802-06-7, Lithium manganese tantalum oxide  
 RL: DEV (Device component use); USES (Uses)  
 (lithium metal oxide cathodes for nonaq. lithium batteries)  
 IT 101920-93-8P, Cobalt lithium nickel oxide ( $\text{Co}_0.5\text{LiNi}_0.5\text{O}_2$ ) 448897-00-5P,  
 Lithium manganese nickel oxide ( $\text{Li}_1.2\text{Mn}_0.4\text{Ni}_0.4\text{O}_2$ ) 677027-33-7P, Cobalt  
 lithium manganese oxide ( $\text{Co}_0.4\text{Li}_1.2\text{Mn}_0.4\text{O}_2$ ) 801287-08-1P, Cobalt  
 lithium manganese nickel oxide ( $(\text{Co},\text{Ni})_0.4\text{Li}_1.2\text{Mn}_0.4\text{O}_2$ ) 801287-09-2P,  
 Cobalt lithium manganese nickel oxide ( $\text{Co}_0.1\text{Li}_1.2\text{Mn}_0.4\text{Ni}_0.3\text{O}_2$ )  
 801287-10-5P, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_0.2\text{Li}_1.2\text{Mn}_0.4\text{Ni}_0.2\text{O}_2$ ) 801287-11-6P, Cobalt lithium manganese nickel  
 oxide ( $\text{Co}_0.3\text{Li}_1.2\text{Mn}_0.4\text{Ni}_0.1\text{O}_2$ ) 801287-13-8P, Cobalt lithium manganese  
 nickel oxide ( $\text{Co}_0.26\text{Li}_1.16\text{Mn}_0.32\text{Ni}_0.26\text{O}_2$ ) 801287-16-1P 801287-18-3P,  
 Cobalt lithium manganese nickel oxide ( $\text{Co}_0.3\text{Li}_1.14\text{Mn}_0.27\text{Ni}_0.3\text{O}_2$ )  
 801287-20-7P, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_0.41\text{Li}_1.06\text{Mn}_0.12\text{Ni}_0.41\text{O}_2$ ) 801287-22-9P 801287-24-1P  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (lithium metal oxide cathodes for nonaq. lithium batteries)

L3 ANSWER 71 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:1020204 CAPLUS  
 DOCUMENT NUMBER: 142:9225  
 TITLE: Nonaqueous electrolyte secondary battery and

charge/discharge system thereof  
INVENTOR(S): Watanabe, Shoichiro; Nagayama, Masatoshi; Kuranaka, So  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co. Ltd., Japan  
SOURCE: PCT Int. Appl., 37 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004102701	A1	20041125	WO 2004-JP6620	20040511
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004342500	A2	20041202	JP 2003-138849	20030516
CN 1735985	A	20060215	CN 2004-80011814	20040511
EP 1655793	A1	20060510	EP 2004-732213	20040511
R: DE, FR, GB				
PRIORITY APPLN. INFO.:			JP 2003-138849	A 20030516
			WO 2004-JP6620	W 20040511
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT				
TI	Nonaqueous electrolyte secondary battery and charge/discharge system thereof			
AB	The disclosed nonaq. electrolyte secondary comprises a pos. electrode composed of a pos. electrode mix layer, a neg. electrode composed of a neg. electrode mix layer, a separator or a lithium ion-conductive porous film interposed between the pos. electrode and the neg. electrode, and a lithium ion-conductive nonaq. electrolyte. The pos. electrode mix layer contains a pos. electrode active material composed of a lithium-transition metal composite oxide, and the lithium-transition metal composite oxide contains lithium, a transition metal and a metal other than the transition metal. The neg. electrode mix layer contains a neg. electrode active material composed of a carbon material. In the region where the pos. electrode mix layer and the neg. electrode mix layer face each other, the ratio (R: Wp/Wn) of the weight of the pos. electrode active material (Wp) contained in the pos. electrode mix layer per unit area to the weight of the neg. electrode active material (Wn) contained in the neg. electrode mix layer per unit area is 1.3-2.2. In the normal operation, the charging final voltage of this nonaq. electrolyte secondary battery is set at 4.25-4.5 V.			
ST	lithium secondary battery electrolyte active substance ratio			
IT	Battery anodes (lithium secondary battery; graphite as anode active substance for)			
IT	Battery cathodes (lithium secondary battery; lithium transition metal oxides as cathode active substances for)			
IT	Secondary batteries (lithium; charging voltage limites for)			
IT	7782-42-5, Graphite, uses RL: TEM (Technical or engineered material use); USES (Uses) (anode active substance for lithium secondary battery)			
IT	144419-56-7, Cobalt lithium magnesium oxide (Co0.95LiMg0.05O2) 372491-83-3, Aluminum cobalt lithium magnesium oxide (Al0.01Co0.94LiMg0.05O2) 372492-00-7, Aluminum cobalt lithium magnesium			

oxide (Al0.01Co0.98LiMg0.01O2) 405890-05-3, Cobalt lithium  
manganese nickel oxide (Co0.1LiMn0.45Ni0.45O2) 405890-08-6, Aluminum  
lithium manganese nickel oxide (Al0.1LiMn0.45Ni0.45O2) 422520-44-3,  
Lithium manganese nickel titanium oxide (LiMn0.45Ni0.45Ti0.1O2)  
477700-15-5, Cobalt lithium oxide (Co0.99LiO2) 478814-69-6, Aluminum  
cobalt lithium magnesium oxide (Al0.05Co0.9LiMg0.05O2) 489431-33-6,  
Aluminum cobalt lithium oxide (Al0.01Co0.98LiO2) 709654-46-6  
719276-54-7, Aluminum cobalt lithium magnesium oxide  
(Al0.01Co0.94Li1.01Mg0.05O2) 798575-07-2, Aluminum cobalt lithium  
magnesium oxide (Al0.01Co0.94Li1.02Mg0.05O2) 798575-08-3, Aluminum  
cobalt lithium magnesium oxide (Al0.01Co0.94Li1.03Mg0.05O2) 798575-10-7,  
Aluminum cobalt lithium magnesium oxide (Al0.05Co0.85LiMg0.1O2)  
798575-11-8, Aluminum cobalt lithium magnesium oxide  
(Al0.02Co0.88LiMg0.1O2) 798575-12-9, Lithium magnesium manganese nickel  
oxide (LiMg0.1Mn0.45Ni0.45O2) 798575-13-0, Lithium manganese nickel  
strontium oxide (LiMn0.45Ni0.45Sr0.1O2)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(cathode active substance for lithium secondary battery)

L3 ANSWER 72 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:1020203 CAPLUS  
DOCUMENT NUMBER: 142:9224  
TITLE: Nonaqueous electrolyte battery  
INVENTOR(S): Nakagawa, Hiroe; Inamasu, Tokuo; Nukuda, Toshiyuki  
PATENT ASSIGNEE(S): Yuasa Corporation, Japan  
SOURCE: PCT Int. Appl., 30 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004102700	A1	20041125	WO 2004-JP3612	20040318
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CN 1788370	A	20060614	CN 2004-80012785	20040318
PRIORITY APPLN. INFO.:			JP 2003-137867	A 20030515
			JP 2003-166455	A 20030611
REFERENCE COUNT:	16	THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		

TI Nonaqueous electrolyte battery  
AB A nonaq. electrolyte battery excelling in battery performance in high-temperature environment. In particular, the disclosed nonaq. electrolyte battery including a pos. electrode and a neg. electrode and, interposed therebetween, a nonaq. electrolyte containing at least one cyclic carbonate having a carbon to carbon  $\pi$  bond and at least one cyclic organic compound having an S=O bond, is characterized in that the main component of pos. electrode active substance as a constituent of the pos. electrode is a sintered oxide of the formula  $\text{Lim NibM1-bO2}$  (wherein M represents at least one element of Groups 1 to 16 [sic] excluding Ni, Li and O, and  $0 \leq m \leq 1.1$ ;  $0 < b < 1$ ) having lamellar rock salt crystal structure. Preferred oxide has the formula  $\text{LimMnaNibCocO2}$  ( $0 \leq m \leq 1.1$ ;  $a+b+c = 1$ ;  $|a-b| \leq 0.05$ ;  $a \neq 0$  and  $b \neq 0$ ;  $0 \leq c < 1$ ).  
ST nonaq electrolyte battery cathode active oxide

IT Battery cathodes  
(lithium battery; lamellar structured mixed oxides as cathode active substance for)

IT Secondary batteries  
(lithium, nonaq. electrolyte; electrolyte containing cyclic carbonates and sulfonyl compds. and lithium-containing mixed oxides for)

IT 532934-40-0P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.16</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)  
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(cathode active substance for nonaq. electrolyte lithium secondary battery)

IT 128975-24-6, Lithium manganese nickel oxide (Li<sub>2</sub>MnNiO<sub>4</sub>) 193215-51-9, Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.3</sub>Ni<sub>0.55</sub>O<sub>2</sub>) 214473-76-4, Cobalt lithium manganese nickel oxide (Co<sub>0.9</sub>LiMn<sub>0.05</sub>Ni<sub>0.05</sub>O<sub>2</sub>) 390362-01-3, Cobalt lithium manganese nickel oxide (Co<sub>0.5</sub>LiMn<sub>0.25</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 686740-96-5, Cobalt lithium manganese nickel oxide (Co<sub>0.67</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>) 763122-46-9, Cobalt lithium manganese nickel oxide (Co<sub>0.84</sub>LiMn<sub>0.08</sub>Ni<sub>0.08</sub>O<sub>2</sub>)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(cathode active substance for nonaq. electrolyte lithium secondary battery)

IT 126-33-0, Sulfolane 872-36-6, Vinylene carbonate 1120-71-4, 1,3-Propanesultone 1633-83-6, 1,4-Butanesultone 2171-74-6, 1,3-Benzodioxol-2-one 3741-38-6, Ethylene sulfite 4427-96-7, Vinylethylene carbonate  
RL: TEM (Technical or engineered material use); USES (Uses)  
(lithium secondary battery nonaq. electrolyte composition containing)

L3 ANSWER 73 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:1018493 CAPLUS

DOCUMENT NUMBER: 142:9180

TITLE: Lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaqueous electrolytes

INVENTOR(S): Nakanishi, Naoya; Satoh, Kouichi; Kitao, Hideki; Akita, Hiroyuki; Funahashi, Atsuhiko; Nohma, Toshiyuki

PATENT ASSIGNEE(S): Sanyo Electric Co. Ltd., Japan

SOURCE: Fr. Demande, 27 pp., Division of Fr. Demande Appl. No. 2003/11876.

CODEN: FRXXBL

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2855328	A1	20041126	FR 2004-6108	20040607
JP 2004134245	A2	20040430	JP 2002-297738	20021010
FR 2845823	A1	20040416	FR 2003-11876	20031010
FR 2845823	B1	20050805		

PRIORITY APPLN. INFO.: JP 2002-297738 A 20021010  
FR 2003-11876 A3 20031010

TI Lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaqueous electrolytes

AB A secondary battery with a nonaq. electrolyte, especially fabricated as a sheet, consists of a carbon-based anode, a separator, a nonaq. electrolyte, and a cathode composed of a mixture of: (1) a lithium manganese spinel oxide of general formula  $\text{Li}_{1+z}\text{Mn}_2\text{O}_4$  ( $z = 0-0.2$ ), and (2) a composite lithium-transition metal spinel oxide of general formula  $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$  ( $y = 0.1-0.6$ ;  $x + y = 0.5-1.0$ ). The compns. also contain a binder for the battery cathode consisting of polyvinylidene difluoride, at a 2-10 weight% concentration The thickness of ratio of the separator to the battery cathode is 0.15-0.9:1. A



preferred anode is graphite coated on a low-crystallinity carbon; a preferred cathode is a mixture of  $\text{LiMn}_2\text{O}_4$  and  $\text{LiCoMnNiO}_2$  (especially  $\text{LiNi}_{0.4}\text{Co}_{0.3}\text{Mn}_{0.3}\text{O}_2$ ).

ST nonaq electrolyte secondary lithium battery; lithium manganate oxide spinel battery cathode nonaq electrolyte; graphite anode nonaq electrolyte secondary lithium battery

IT Battery anodes  
(carbon-graphite composite; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Battery cathodes  
(lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Fluoropolymers, uses  
RL: DEV (Device component use); USES (Uses)  
(lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Spinel-type crystals  
(lithium manganate-type, battery cathodes; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Battery electrolytes  
(nonaq.; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 12057-17-9, Lithium manganese oxide ( $\text{LiMn}_2\text{O}_4$ ) 607706-67-2, Cobalt lithium manganese nickel oxide ( $(\text{Co,Mn,Ni})\text{LiO}_2$ ) 609349-41-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ )  
RL: DEV (Device component use); USES (Uses)  
(battery cathodes containing; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 24937-79-9, Polyvinylidene difluoride  
RL: DEV (Device component use); USES (Uses)  
(binder, for fabrication of battery cathodes; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses  
RL: DEV (Device component use); USES (Uses)  
(carbon composites with, battery anodes; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 9003-07-0, Polypropylene  
RL: DEV (Device component use); USES (Uses)  
(film, battery separators; lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

L3 ANSWER 74 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:1018492 CAPLUS

DOCUMENT NUMBER: 142:9179

TITLE: Lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaqueous electrolytes

INVENTOR(S): Nakanishi, Naoya; Satoh, Kouichi; Kitao, Hideki; Akita, Hiroyuki; Funahashi, Atsuhiko; Nohma, Toshiyuki

PATENT ASSIGNEE(S): Sanyo Electric Co. Ltd., Japan

SOURCE: Fr. Demande, 27 pp., Division of Fr. Demande Appl. No.

2003/11876.  
 CODEN: FRXXBL  
 DOCUMENT TYPE: Patent  
 LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2855327	A1	20041126	FR 2004-6107	20040607
JP 2004134245	A2	20040430	JP 2002-297738	20021010
FR 2845823	A1	20040416	FR 2003-11876	20031010
FR 2845823	B1	20050805		

PRIORITY APPLN. INFO.: JP 2002-297738 A 20021010  
 FR 2003-11876 A3 20031010

TI Lithium manganate and lithium-transition metal manganate spinels as cathodes for secondary lithium batteries with nonaqueous electrolytes

AB A secondary battery with a nonaq. electrolyte, especially fabricated as a sheet, consists of a carbon-based anode, a separator, a nonaq. electrolyte, and a cathode composed of a mixture of: (1) a lithium manganese spinel oxide of general formula  $Li_{1+z}Mn_2O_4$  ( $z = 0-0.2$ ), and (2) a composite lithium-transition metal manganate spinel oxide of general formula  $LiNi_{1-x-y}Co_xMn_yO_2$  ( $y = 0.1-0.6$ ;  $x + y = 0.5-1.0$ ). The thickness of ratio of the separator to the battery cathode is 0.15-0.9:1. A preferred anode is graphite coated on a low-crystallinity carbon; a preferred cathode is a mixture of  $LiMn_2O_4$  and  $LiCoMnNiO_2$  (especially  $LiNi_{0.4}Co_{0.3}Mn_{0.3}O_2$ ).

ST nonaq electrolyte secondary lithium battery; lithium manganate oxide spinel battery cathode nonaq electrolyte; graphite anode nonaq electrolyte secondary lithium battery

IT Battery anodes  
 (carbon-graphite composites; lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Battery cathodes  
 Secondary battery separators  
 (lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Fluoropolymers, uses  
 RL: DEV (Device component use); USES (Uses)  
 (lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Spinel-type crystals  
 (lithium manganate-type, battery cathodes; lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT Battery electrolytes  
 (nonaq.; lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 12057-17-9, Lithium manganese oxide ( $LiMn_2O_4$ ) 607706-67-2, Cobalt lithium manganese nickel oxide ( $(Co,Mn,Ni)LiO_2$ ) 609349-41-9, Cobalt lithium manganese nickel oxide ( $Co_{0.3}LiMn_{0.3}Ni_{0.3}O_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (battery cathodes containing; lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 24937-79-9, Polyvinylidene difluoride  
 RL: DEV (Device component use); USES (Uses)  
 (binder, battery separators containing; lithium manganate and lithium-transition metal oxide spinels as cathodes for secondary lithium batteries with nonaq. electrolytes)

IT 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)  
(carbon composites with, battery anodes; lithium manganate  
and lithium-transition metal oxide spinels as cathodes for secondary  
lithium batteries with nonaq. electrolytes)

IT 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(electrolyte; lithium manganate and lithium-transition metal oxide  
spinel as cathodes for secondary lithium batteries with  
nonaq. electrolytes)

IT 9003-07-0, Polypropylene  
RL: DEV (Device component use); USES (Uses)  
(film, battery separators; lithium manganate and  
lithium-transition metal oxide spinels as cathodes for secondary  
lithium batteries with nonaq. electrolytes)

IT 7440-44-0, Carbon, uses  
RL: DEV (Device component use); USES (Uses)  
(graphite composites with, battery anodes; lithium manganate  
and lithium-transition metal oxide spinels as cathodes for secondary  
lithium batteries with nonaq. electrolytes)

L3 ANSWER 75 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:938487 CAPLUS  
DOCUMENT NUMBER: 142:117474  
TITLE: Electrochemical characteristics of  
LiNi<sub>0.5</sub>-xMn<sub>0.5</sub>-xCo<sub>2</sub>xO<sub>2</sub> (0 < x ≤ 0.1) prepared  
by spray dry method  
AUTHOR(S): Li, De-Cheng; Noguchi, Hideyuki; Yoshio, Masaki  
CORPORATE SOURCE: Department of Applied Chemistry, Saga University,  
Saga, 8408502, Japan  
SOURCE: Electrochimica Acta (2004), 50(2-3), 427-430  
CODEN: ELCAAV; ISSN: 0013-4686  
PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST electrochem cobalt lithium manganese nickel oxide cathode spray dry;  
lithium secondary battery cathode layered crystal discharge  
capacity stability

IT Battery cathodes  
(electrochem. characteristics of LiNi<sub>0.5</sub>-xMn<sub>0.5</sub>-xCo<sub>2</sub>xO<sub>2</sub> (0 < x ≤  
0.1) prepared by spray dry method)

IT Secondary batteries  
(lithium; electrochem. characteristics of LiNi<sub>0.5</sub>-xMn<sub>0.5</sub>-xCo<sub>2</sub>xO<sub>2</sub> (0 < x  
≤ 0.1) prepared by spray dry method)

IT Electric current-potential relationship  
(of battery charging-discharging; electrochem.  
characteristics of LiNi<sub>0.5</sub>-xMn<sub>0.5</sub>-xCo<sub>2</sub>xO<sub>2</sub> (0 < x ≤ 0.1) prepared  
by spray dry method)

IT 128975-24-6P, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
193215-96-2P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 390362-01-3P, Cobalt lithium manganese nickel  
oxide (Co<sub>0.5</sub>LiMn<sub>0.25</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 404904-11-6P, Cobalt lithium manganese  
nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 405890-05-3P, Cobalt lithium  
manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 459408-76-5P,  
Cobalt lithium manganese nickel oxide (Co<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>)  
493394-61-9P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.3</sub>LiMn<sub>0.35</sub>Ni<sub>0.35</sub>O<sub>2</sub>) 697766-76-0P, Cobalt lithium manganese  
nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(electrochem. characteristics of LiNi<sub>0.5</sub>-xMn<sub>0.5</sub>-xCo<sub>2</sub>xO<sub>2</sub> (0 < x ≤  
0.1) prepared by spray dry method)

L3 ANSWER 76 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:935422 CAPLUS

DOCUMENT NUMBER: 141:398204  
 TITLE: Cathode active materials, their production method, and nonaqueous electrolyte lithium secondary batteries  
 INVENTOR(S): Nakajima, Motoe; Inada, Fumi; Uchikawa, Akio  
 PATENT ASSIGNEE(S): Hitachi Metals, Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004311427	A2	20041104	JP 2004-86963	20040324
PRIORITY APPLN. INFO.:			JP 2003-82820	A 20030325
TI	Cathode active materials, their production method, and nonaqueous electrolyte lithium secondary batteries			
AB	The disclosed cathode active material is a compound of the formula $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{X}_z\text{O}_2$ ( $\text{X} = \text{Co}, \text{Al}; 1 \leq a \leq 1.2; 0.2 \leq x \leq 0.5; 0.35 \leq y \leq 0.8; 0 \leq z \leq 0.45; x + y + z = 1$ ) having lamellar structure, crystallite size (measured by Hall's method) of 400-800 Å, and packing degree, (tap d./theor. d)X100, of $\leq 55\%$ . The lithium secondary battery prepared with the cathode active materials shows good resistance toward internal resistivity changes.			
ST	lithium battery cathode active lithium manganate nickelate			
IT	Battery cathodes (lithium battery; lithium manganate nickelate derivs. as cathode active substances for)			
IT	787635-96-5P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.31}\text{Li}_{1.08}\text{Mn}_{0.33}\text{Ni}_{0.36}\text{O}_2$ ) 787635-97-6P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{Li}_{1.08}\text{Mn}_{0.3}\text{Ni}_{0.4}\text{O}_2$ ) 787635-98-7P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.08}\text{Mn}_{0.3}\text{Ni}_{0.5}\text{O}_2$ ) 787635-99-8P 787636-00-4P 787636-01-5P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.1}\text{Li}_{1.08}\text{Mn}_{0.3}\text{Ni}_{0.6}\text{O}_2$ ) RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (lithium secondary battery cathode active substance)			

L3 ANSWER 77 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:876924 CAPLUS  
 DOCUMENT NUMBER: 141:368366  
 TITLE: Secondary nonaqueous battery  
 INVENTOR(S): Tajiri, Hiroyuki; Kato, Shiro; Yokouchi, Kae; Yada, Shizukuni  
 PATENT ASSIGNEE(S): Osaka Gas Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004296325	A2	20041021	JP 2003-88839	20030327
PRIORITY APPLN. INFO.:			JP 2003-88839	20030327
TI	Secondary nonaqueous battery			
AB	The thin-flat battery, having thickness $< 12$ mm, energy capacity $\geq 30$ Wh, and volumetric energy $\geq 180$ Wh/l, consists of an anode, a cathode, a separator, and a Li salt containing electrolyte solution; where the separator is a nonwoven fabric or a paper, having thickness 20-50 $\mu\text{m}$ and air permeability 20-200 s/100 cc.			
ST	secondary battery separator nonwoven fabric paper thickness air			

permeability  
 IT Secondary batteries  
   (lithium; separators containing nonwoven fabrics or papers with controlled  
   thickness and air permeability for secondary lithium batteries  
   )  
 IT Petroleum pitch  
   Secondary battery separators  
     (separators containing nonwoven fabrics or papers with controlled thickness  
     and air permeability for secondary lithium batteries)  
 IT Rayon, uses  
   RL: DEV (Device component use); USES (Uses)  
     (separators containing nonwoven fabrics or papers with controlled thickness  
     and air permeability for secondary lithium batteries)  
 IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate  
   7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate  
   193215-96-2, Cobalt lithium manganese nickel oxide  
   (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 346417-97-8, Cobalt lithium manganese nickel oxide  
   (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
   RL: DEV (Device component use); USES (Uses)  
     (separators containing nonwoven fabrics or papers with controlled thickness  
     and air permeability for secondary lithium batteries)

L3 ANSWER 78 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:876871 CAPLUS  
 DOCUMENT NUMBER: 141:368347  
 TITLE: Secondary nonaqueous battery  
 INVENTOR(S): Tajiri, Hiroyuki; Kuriyama, Kazuya; Yada, Shizukuni  
 PATENT ASSIGNEE(S): Osaka Gas Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.  
           CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004296113	A2	20041021	JP 2003-83177	20030325
PRIORITY APPLN. INFO.:			JP 2003-83177	20030325

TI Secondary nonaqueous battery  
 AB The thin-flat battery, having thickness <12 mm, energy capacity  
   ≥30 Wh, and volumetric energy ≥180 Wh/l, has a structure,  
   comprising an anode, a cathode, a separator, and a Li salt containing  
   electrolyte solution in a container; where a cathode active mass in the  
   cathode is a Li Mn Ni composite oxide: Li<sub>a</sub>Ni<sub>b</sub>Mn<sub>c</sub>MdO<sub>2</sub> (a = 1-1.1;  
   0.3 ≤ b < 0.5; 0.3 ≤ c < 0.5; 0 < d ≤ 0.4; b ≥ c;  
   b+c+d = 1); and the cathode contains a natural graphite as conductor,  
   having BET spec. surface area ≥100 m<sup>2</sup>/g.  
 ST secondary battery cathode lithium manganese nickel composite  
   oxide; anode conductor natural graphite secondary lithium battery  
 IT Petroleum pitch  
   (anodes containing amorphous C coated graphite particles for secondary  
   lithium batteries)  
 IT Battery anodes  
   (anodes containing natural graphite conductors with controlled spec.  
   surface area for secondary lithium batteries)  
 IT Battery cathodes  
   (cathodes containing lithium nickel manganese composite oxides for  
   secondary lithium batteries)  
 IT Secondary batteries  
   (lithium; secondary lithium batteries containing natural graphite  
   conductors in anodes and lithium nickel manganese oxides in cathodes)  
 IT Rayon, uses  
   RL: DEV (Device component use); USES (Uses)  
     (secondary lithium batteries containing amorphous C coated  
     graphite particles in anodes and lithium nickel manganese oxides in

cathodes)

IT 7782-42-5, Graphite, uses  
 RL: DEV (Device component use); USES (Uses)  
 (anodes containing amorphous C coated graphite particles for secondary lithium batteries)

IT 346417-97-8, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (cathodes containing lithium nickel manganese composite oxides for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate 21324-40-3, Lithium hexafluorophosphate 193215-96-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (secondary lithium batteries containing amorphous C coated graphite particles in anodes and lithium nickel manganese oxides in cathodes)

L3 ANSWER 79 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:876870 CAPLUS

DOCUMENT NUMBER: 141:368346

TITLE: Secondary nonaqueous battery

INVENTOR(S): Tajiri, Hiroyuki; Kuriyama, Kazuya; Yada, Shizukuni

PATENT ASSIGNEE(S): Osaka Gas Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
 CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004296110	A2	20041021	JP 2003-83160	20030325
PRIORITY APPLN. INFO.:			JP 2003-83160	20030325

TI Secondary nonaqueous battery

AB The thin-flat battery, having thickness <12 mm, energy capacity ≥30 Wh, and volumetric energy ≥180 Wh/l, has a structure, comprising an anode, a cathode, a separator, and a Li salt containing electrolyte solution in a container; where (1) a cathode active mass in the cathode is a Li Mn Ni composite oxide: Li<sub>a</sub>Ni<sub>b</sub>Mn<sub>c</sub>MdO<sub>2</sub> (a = 1-1.1; 0.3 ≤ b < 0.5; 0.3 ≤ c < 0.5; 0 < d ≤ 0.4; b ≥ c; b+c+d = 1); (2) an anode active mass in the anode is dual-structured graphite particles, having an amorphous C coated on a core part which comprises nature graphite particles; (3) the graphite has d<sub>002</sub> ≤0.34 nm, determined by x-ray wide angle diffraction, average particle size 15-40 μm, and tap d. ≥0.8 g/cm<sup>3</sup>; and the amorphous C has plane distance ≥0.34 nm.

ST secondary battery cathode lithium manganese nickel composite oxide; anode amorphous C coated graphite particle secondary lithium battery

IT Battery anodes  
 Petroleum pitch  
 (anodes containing amorphous C coated graphite particles for secondary lithium batteries)

IT Battery cathodes  
 (cathodes containing lithium nickel manganese composite oxides for secondary lithium batteries)

IT Secondary batteries  
 (lithium; secondary lithium batteries containing amorphous C coated graphite particles in anodes and lithium nickel manganese oxides in cathodes)

IT Rayon, uses  
 RL: DEV (Device component use); USES (Uses)  
 (secondary lithium batteries containing amorphous C coated graphite particles in anodes and lithium nickel manganese oxides in

cathodes)  
 IT 7782-42-5, Graphite, uses  
 RL: DEV (Device component use); USES (Uses)  
 (anodes containing amorphous C coated graphite particles for secondary lithium batteries)  
 IT 193215-96-2, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 346417-97-8, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (cathodes containing lithium nickel manganese composite oxides for secondary lithium batteries)  
 IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate  
 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (secondary lithium batteries containing amorphous C coated graphite particles in anodes and lithium nickel manganese oxides in cathodes)

L3 ANSWER 80 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:876869 CAPLUS  
 DOCUMENT NUMBER: 141:368345  
 TITLE: Secondary nonaqueous electrolyte battery  
 INVENTOR(S): Tajiri, Hiroyuki; Kuriyama, Kazuya; Yada, Shizukuni  
 PATENT ASSIGNEE(S): Osaka Gas Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 24 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004296106	A2	20041021	JP 2003-83127	20030325

PRIORITY APPLN. INFO.: JP 2003-83127 20030325

TI Secondary nonaqueous electrolyte battery  
 AB A ≤12 mm thick secondary battery, having an energy capacity ≥30 W.h and a volume energy d. ≥180 W.h/L, uses Li<sub>a</sub>Ni<sub>b</sub>Mn<sub>c</sub>MdO<sub>2</sub> [M = Co, Al, or Fe; 1 ≤a ≤1.1, 0.3 ≤b ≤0.5, 0.3 ≤c ≤0.5, d ≤0.4, b ≥c, (b+c+d) =1] as cathode active mass; graphite having d<sub>002</sub> ≤0.34nm, average particle size 15-40 μm, and tap d. ≥0.8 g/cm<sup>3</sup> coated with amorphous carbon having interplanar spacing ≥0.34 nm for anode active mass, and an electrolyte solvent containing ethylene carbonate, MeEtCO<sub>3</sub>, and 0.1-5% vinylene carbonate.  
 ST secondary lithium battery electrode electrolyte solvent compn; lithium manganese nickel oxide battery cathode; amorphous carbon coated graphite battery anode; ethylene carbonate ethyl methyl carbonate vinylene carbonate battery electrolyte  
 IT Battery anodes  
 (amorphous carbon coated graphite anode active mass for thin secondary lithium batteries)  
 IT Carbonaceous materials (technological products)  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (amorphous carbon coated graphite anode active mass for thin secondary lithium batteries)  
 IT Battery cathodes  
 (compns. of substituted lithium manganese nickel oxide cathode active mass for thin secondary lithium batteries)  
 IT Battery electrolytes  
 (electrolyte solvent mixts. containing vinylene carbonate for thin secondary lithium batteries)  
 IT Secondary batteries  
 (lithium; compns. of electrode active mass and electrolyte solvent mixts. thin secondary lithium batteries)  
 IT 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)  
 (amorphous carbon coated graphite anode active mass for thin secondary lithium batteries)

IT 193215-96-2, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 346417-97-8, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)  
 (comps. of substituted lithium manganese nickel oxide cathode active mass for thin secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate 872-36-6, Vinylene carbonate 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)  
 (electrolyte solvent mixts. containing vinylene carbonate for thin secondary lithium batteries)

L3 ANSWER 81 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:872897 CAPLUS

DOCUMENT NUMBER: 141:352755

TITLE: Cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery

INVENTOR(S): Lee, Jae-hyun; Jang, Min-chul; Ryu, Duk-hyun; Jeong, Jun-yong; Lee, Han-ho; Ahn, Soon-ho

PATENT ASSIGNEE(S): Lg Chem Ltd., S. Korea

SOURCE: PCT Int. Appl., 27 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004091016	A1	20041021	WO 2004-KR786	20040406
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2004088292	A	20041016	KR 2003-22429	20030409
CA 2522107	AA	20041021	CA 2004-2522107	20040406
EP 1609201	A1	20051228	EP 2004-726032	20040406
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
JP 2006512747	T2	20060413	JP 2005-518275	20040406
BR 2004009759	A	20060509	BR 2004-9759	20040406
CN 1771618	A	20060510	CN 2004-80009497	20040406
PRIORITY APPLN. INFO.:			KR 2003-22429	A 20030409
			WO 2004-KR786	W 20040406

REFERENCE COUNT: .4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery

ST lithium secondary battery cathode additive overdischarge performance improvement

IT Battery cathodes  
 (cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery)

IT Intercalation  
 (electrochem.; cathode active material comprising additive for



improving overdischarge-performance of lithium secondary battery)

IT Transition metal oxides  
 RL: DEV (Device component use); USES (Uses)  
 (lithiated; cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery)

IT Secondary batteries  
 (lithium; cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery)

IT Intercalation  
 (retro, electrochem.; cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery)

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7791-03-9, Lithium perchlorate 12031-65-1, Lithium nickel oxide (LiNiO<sub>2</sub>) 12057-17-9, Lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>) 12162-79-7, Lithium manganese oxide limno<sub>2</sub> 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 13824-63-0, Cobalt lithium phosphate colipo<sub>4</sub> 14283-07-9, Lithium tetrafluoroborate 15365-14-7, Iron lithium phosphate felipo<sub>4</sub> 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9, Methyl propyl carbonate 61179-01-9, Aluminum lithium manganese oxide 90076-65-6 162684-16-4, Lithium manganese nickel oxide 188651-66-3, Chromium lithium manganese oxide (Cr<sub>0.2</sub>LiMn<sub>1.8</sub>O<sub>4</sub>) 188651-74-3, Cobalt lithium manganese oxide ((Co,Mn)<sub>2</sub>LiO<sub>4</sub>) 188651-75-4, Lithium manganese nickel oxide (Li(Mn,Ni)<sub>2</sub>O<sub>4</sub>) 204450-96-4, Chromium lithium manganese oxide 214536-41-1, Cobalt lithium manganese oxide 253875-65-9, Cobalt lithium manganese oxide ((Co,Mn)LiO<sub>2</sub>) 600177-49-9, Lithium manganese nickel oxide (Li(Mn,Ni)O<sub>2</sub>) 607706-62-7, Cobalt lithium nickel oxide ((Co,Ni)Li<sub>2</sub>O<sub>2</sub>) 607706-67-2, Cobalt lithium manganese nickel oxide ((Co,Mn,Ni)LiO<sub>2</sub>) 607706-68-3, Cobalt lithium manganese nickel oxide ((Co,Mn,Ni)<sub>2</sub>LiO<sub>4</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (cathode active material comprising additive for improving overdischarge-performance of lithium secondary battery)

L3 ANSWER 82 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:831030 CAPLUS  
 DOCUMENT NUMBER: 143:29289  
 TITLE: The effect of Si doping on the electrochemical characteristics of LiNi<sub>x</sub>Mn<sub>y</sub>Co(1-x-y)O<sub>2</sub>  
 AUTHOR(S): Na, Seong-Hwan; Kim, Hyun-Soo; Moon, Seong-In  
 CORPORATE SOURCE: KERI, Changwon, 641-120, S. Korea  
 SOURCE: Solid State Ionics: The Science and Technology of Ions in Motion, Proceedings of the Asian Conference, 9th, Jeju Island, Republic of Korea, June 6-11, 2004 (2004), 619-627. Editor(s): Chowdari, B. V. R. World Scientific Publishing Co. Pte. Ltd.: Singapore, Singapore.  
 CODEN: 69FXBU; ISBN: 981-238-932-6  
 DOCUMENT TYPE: Conference  
 LANGUAGE: English  
 REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT Battery cathodes  
 Doping  
 (effect of Si doping on electrochem. characteristics of LiNi<sub>x</sub>Mn<sub>y</sub>Co(1-x-y)O<sub>2</sub>)

IT Secondary batteries  
 (lithium; effect of Si doping on electrochem. characteristics of LiNi<sub>x</sub>Mn<sub>y</sub>Co(1-x-y)O<sub>2</sub> in relation to)

IT 182442-95-1, Cobalt lithium manganese nickel oxide 852832-42-9  
 852832-43-0 852832-44-1 852832-45-2  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical

process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(effect of Si doping on electrochem. characteristics of  
LiNixMnyCo(1-x-y)O2)

L3 ANSWER 83 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:823603 CAPLUS  
DOCUMENT NUMBER: 141:334872  
TITLE: Cathode active material for secondary nonaqueous  
lithium battery, its manufacture, and the  
battery which uses the active mass  
INVENTOR(S): Inada, Fumi; Nakajima, Motoe; Uchikawa, Akio  
PATENT ASSIGNEE(S): Hitachi Metals, Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004281253	A2	20041007	JP 2003-71569	20030317

PRIORITY APPLN. INFO.: JP 2003-71569 20030317

TI Cathode active material for secondary nonaqueous lithium battery  
, its manufacture, and the battery which uses the active mass

AB The active mass is a layer crystal structured Li transition metal  
composite oxide: Li<sub>a</sub>M<sub>x</sub>Ni<sub>y</sub>M<sub>z</sub>O<sub>2</sub> [M = Co and/or Al; a = 1-1.2; x = 0-0.65; y  
= 0.35-1; z = 0-0.65; and (x+y+z) = 1]; where the active mass has an  
initial charge-discharge efficiency ≥70% when using Li as an anode.  
The active mass is manufactured by wet mixing a Li compound with a transition  
metal compound; drying the mixture; firing in air, a N atmospheric, or an O atm at  
850-1100°; cracking; and heat treating in air, a N atmospheric, or an O  
atm at 500-800°. The battery has the above cathode  
active mass.

ST secondary battery cathode lithium transition metal composite  
oxide manuf

IT Battery cathodes  
(compns. and manufacture of cathode active mass containing lithium transition  
metal composite oxides for secondary lithium batteries)

IT Secondary batteries  
(lithium; compns. and manufacture of cathode active mass containing lithium  
transition metal composite oxides for secondary lithium  
batteries)

IT 176206-89-6P, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.2</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
193215-73-5P, Aluminum cobalt lithium manganese nickel oxide  
(Al<sub>0.1</sub>Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 193215-96-2P, Cobalt lithium  
manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 217309-43-8P, Cobalt  
lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 769973-31-1P,  
Cobalt lithium manganese nickel oxide (Co<sub>0.5</sub>LiMn<sub>0.05</sub>Ni<sub>0.45</sub>O<sub>2</sub>)  
RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(compns. and manufacture of cathode active mass containing lithium transition  
metal composite oxides for secondary lithium batteries)

L3 ANSWER 84 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:753539 CAPLUS  
DOCUMENT NUMBER: 141:280344  
TITLE: Secondary lithium battery  
INVENTOR(S): Kasai, Masahiro; Suzuki, Katsunori  
PATENT ASSIGNEE(S): Shin-Kobe Electric Machinery Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004259511	A2	20040916	JP 2003-47151	20030225
PRIORITY APPLN. INFO.:			JP 2003-47151	20030225

TI Secondary lithium battery

AB The battery uses a cathode active mass containing a layer structured oxide containing Li, Co, Ni, and Mn and a spinel type oxide containing Li and Mn; where the layer structured oxide is  $\geq 50\%$  of the total cathode active mass and the Ni content in the oxide is  $\leq 50\text{mol}\%$  of all metals other than Li.

ST secondary battery cathode active mass oxide mixt compn; layered lithium cobalt nickel manganese oxide battery cathode; spinel lithium manganese oxide battery cathode

IT Battery cathodes  
(mixts. of layered lithium transition metal oxide and spine type lithium manganese oxide for secondary lithium battery cathodes)

IT 247565-42-0, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.05</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 757974-77-9, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>Li<sub>1.02</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 757974-78-0, Cobalt lithium manganese nickel oxide (Co<sub>0.5</sub>Li<sub>1.08</sub>Mn<sub>0.33</sub>Ni<sub>0.2</sub>O<sub>2</sub>) 757974-79-1 757974-80-4 757974-81-5, Aluminum lithium manganese oxide (Al<sub>0.08</sub>Li<sub>1.1</sub>Mn<sub>1.82</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(mixts. of layered lithium transition metal oxide and spine type lithium manganese oxide for secondary lithium battery cathodes)

L3 ANSWER 85 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:621425 CAPLUS

DOCUMENT NUMBER: 141:382011

TITLE: Structural and electrochemical properties of layered Li[Ni<sub>0.5</sub>Mn<sub>0.5</sub>]<sub>1-x</sub>CoxO<sub>2</sub> positive materials synthesized by ultrasonic spray pyrolysis method

AUTHOR(S): Oh, Sung Woo; Park, Sang Ho; Park, Chul-Wan; Sun, Yang-Kook

CORPORATE SOURCE: College of Engineering, Center for Information and Communication Materials, Department of Chemical Engineering, Hanyang University, Seungdong-Gu, Seoul, 133-791, S. Korea

SOURCE: Solid State Ionics (2004), 171(3-4), 167-172  
CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode pyrolysis lithium battery

IT Secondary batteries  
(lithium; properties of layered Li[Ni<sub>0.5</sub>Mn<sub>0.5</sub>]<sub>1-x</sub>CoxO<sub>2</sub> cathode material for lithium batteries synthesized by ultrasonic spray pyrolysis)

IT Battery cathodes  
(properties of layered Li[Ni<sub>0.5</sub>Mn<sub>0.5</sub>]<sub>1-x</sub>CoxO<sub>2</sub> cathode material for lithium batteries synthesized by ultrasonic spray pyrolysis)

IT Calcination  
(spray; properties of layered Li[Ni<sub>0.5</sub>Mn<sub>0.5</sub>]<sub>1-x</sub>CoxO<sub>2</sub> cathode material for lithium batteries synthesized by ultrasonic spray pyrolysis)

IT 7440-02-0, Nickel, occurrence  
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)  
(in layered Li[Ni<sub>0.5</sub>Mn<sub>0.5</sub>]<sub>1-x</sub>CoxO<sub>2</sub> cathode material for lithium batteries synthesized by ultrasonic spray pyrolysis)

IT 783372-49-6, Lithium manganese nickel oxide (Li<sub>1.08</sub>Mn<sub>0.48</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
783372-50-9, Cobalt lithium manganese nickel oxide

(Co<sub>0.05</sub>Li<sub>1.07</sub>Mn<sub>0.46</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 783372-51-0, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.03</sub>Mn<sub>0.43</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 783372-52-1, Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>Li<sub>1.03</sub>Mn<sub>0.4</sub>Ni<sub>0.42</sub>O<sub>2</sub>) 783372-53-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>Li<sub>1.04</sub>Mn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 783372-54-3, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>Li<sub>1.05</sub>Mn<sub>0.33</sub>Ni<sub>0.32</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (properties of layered Li[Ni<sub>0.5</sub>Mn<sub>0.5</sub>]<sub>1-x</sub>CoxO<sub>2</sub> cathode material for lithium batteries synthesized by ultrasonic spray pyrolysis)

L3 ANSWER 86 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:606608 CAPLUS  
 DOCUMENT NUMBER: 141:159839  
 TITLE: Precursor material for secondary lithium battery cathode material, the cathode material, and their manufacture  
 INVENTOR(S): Kajiya, Yoshio; Tasaki, Hiroshi  
 PATENT ASSIGNEE(S): Nikko Materials Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 37 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004064180	A1	20040729	WO 2003-JP16416	20031222
W: CN, JP, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
EP 1587156	A1	20051019	EP 2003-782865	20031222
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
CN 1735986	A	20060215	CN 2003-80108519	20031222
US 2006121350	A1	20060608	US 2005-541817	20050708
PRIORITY APPLN. INFO.:			JP 2003-1955	A 20030108
			WO 2003-JP16416	W 20031222

TI Precursor material for secondary lithium battery cathode material, the cathode material, and their manufacture  
 ST secondary lithium battery cathode material lithium composite oxide manuf; battery cathode lithium oxide sodium sulfur impurity content control  
 IT Battery cathodes  
 (cathodes materials containing Li composite oxides with controlled impurities content for secondary lithium batteries)  
 IT Secondary batteries  
 (lithium; cathodes materials containing Li composite oxides with controlled impurities content for secondary lithium batteries)  
 IT 193215-50-8, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>)  
 193215-53-1, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
 193215-96-2, Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>): 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 728942-11-8  
 RL: DEV (Device component use); USES (Uses)  
 (cathodes materials containing Li composite oxides with controlled impurities content for secondary lithium batteries)  
 IT 7440-23-5, Sodium, miscellaneous 7704-34-9, Sulfur, miscellaneous  
 RL: MSC (Miscellaneous)  
 (cathodes materials containing Li composite oxides with controlled impurities content for secondary lithium batteries)

L3 ANSWER 87 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:576605 CAPLUS  
 DOCUMENT NUMBER: 141:382002  
 TITLE: Factors influencing the chemical lithium extraction

AUTHOR(S): rate from layered  $\text{LiNi}_{1-y-z}\text{Co}_y\text{Mn}_z\text{O}_2$  cathodes  
 Venkatraman, S.; Choi, J.; Manthiram, A.  
 CORPORATE SOURCE: Materials Science and Engineering Program, The  
 University of Texas at Austin, Austin, TX, 78712, USA  
 SOURCE: Electrochemistry Communications (2004), 6(8), 832-837  
 CODEN: ECCMF9; ISSN: 1388-2481  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

IT Secondary batteries  
 (lithium, cathodes; factors influencing lithium extraction rate from layered  
 $\text{LiNi}_{1-y-z}\text{Co}_y\text{Mn}_z\text{O}_2$  cathodes)  
 IT 12031-65-1D, Lithium nickel oxide ( $\text{LiNiO}_2$ ), oxygen-deficient  
 12190-79-3D, Cobalt lithium oxide ( $\text{CoLiO}_2$ ), oxygen-deficient  
 101920-93-8D, Cobalt lithium nickel oxide ( $\text{Co}_{0.5}\text{LiNi}_{0.5}\text{O}_2$ ),  
 oxygen-deficient 113066-91-4D, Cobalt lithium nickel oxide  
 ( $\text{Co}_{0.8}\text{LiNi}_{0.2}\text{O}_2$ ), oxygen-deficient 113066-92-5D, Cobalt lithium nickel  
 oxide ( $\text{Co}_{0.9}\text{LiNi}_{0.1}\text{O}_2$ ), oxygen-deficient 116327-68-5D, Cobalt lithium  
 nickel oxide ( $\text{Co}_{0.3}\text{LiNi}_{0.7}\text{O}_2$ ), oxygen-deficient 118557-81-6D, Cobalt  
 lithium nickel oxide ( $\text{Co}_{0.7}\text{LiNi}_{0.3}\text{O}_2$ ), oxygen-deficient 128975-24-6D,  
 Lithium manganese nickel oxide ( $\text{Li}_2\text{MnNiO}_4$ ), oxygen-deficient  
 143623-51-2D, Cobalt lithium nickel oxide ( $\text{Co}_{0.15}\text{LiNi}_{0.85}\text{O}_2$ ),  
 oxygen-deficient 346417-97-8D, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ), oxygen-deficient 390362-01-3D, Cobalt lithium  
 manganese nickel oxide ( $\text{Co}_{0.5}\text{LiMn}_{0.25}\text{Ni}_{0.25}\text{O}_2$ ), oxygen-deficient  
 405890-05-3D, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ), oxygen-deficient 459408-76-5D, Cobalt  
 lithium manganese nickel oxide ( $\text{Co}_{0.05}\text{LiMn}_{0.48}\text{Ni}_{0.48}\text{O}_2$ ), oxygen-deficient  
 697766-76-0D, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.15}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ), oxygen-deficient 781672-36-4D, Lithium  
 manganese nickel oxide ( $\text{LiMn}_{0.25}\text{Ni}_{0.75}\text{O}_2$ ), oxygen-deficient  
 781672-38-6D, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.58}\text{LiMn}_{0.21}\text{Ni}_{0.21}\text{O}_2$ ), oxygen-deficient 781672-40-0D, Cobalt lithium  
 manganese nickel oxide ( $\text{Co}_{0.41}\text{LiMn}_{0.29}\text{Ni}_{0.29}\text{O}_2$ ), oxygen-deficient  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PRP (Properties); PROC (Process)  
 (factors influencing lithium extraction rate from layered  $\text{LiNi}_{1-y-z}\text{Co}_y\text{Mn}_z\text{O}_2$   
 cathodes)

L3 ANSWER 88 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:533748 CAPLUS  
 DOCUMENT NUMBER: 141:74296  
 TITLE: Nonaqueous electrolyte rechargeable battery  
 INVENTOR(S): Nagayama, Masatoshi; Yoshizawa, Hiroshi  
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
 SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004126661	A1	20040701	US 2003-730049	20031209
JP 2004207120	A2	20040722	JP 2002-376664	20021226
PRIORITY APPLN. INFO.:			JP 2002-376664	A 20021226

TI Nonaqueous electrolyte rechargeable battery  
 AB A nonaq. electrolyte rechargeable battery includes: (a) a pos.  
 electrode capable of charging and discharging lithium; (b) a neg.  
 electrode capable of charging and discharging lithium; (c) a separator or  
 a lithium ion conductive layer interposed between the pos. electrode and  
 the neg. electrode; and (d) a lithium ion conductive nonaq. electrolyte,  
 wherein the pos. electrode contains a mixture of a first pos. electrode

active material and a second pos. electrode active material, the first pos. electrode active material includes lithium oxide containing manganese, the lithium oxide further contains aluminum and/or magnesium, and the second pos. electrode active material includes  $\text{Li}_x\text{Co}_{1-y-z}\text{Mg}_y\text{Al}_z\text{O}_2$  where  $1 \leq x \leq 1.03$ ,  $0.005 \leq y \leq 0.1$  and  $0.001 \leq z < 0.02$ .

ST nonaq electrolyte rechargeable battery

IT Battery cathodes

Secondary batteries

(nonaq. electrolyte rechargeable battery)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate 61179-01-9, Aluminum lithium manganese oxide 136479-37-3, Lithium magnesium manganese oxide  $\text{LiMg}_0.2\text{Mn}_{1.8}\text{O}_4$  142447-12-9, Cobalt lithiummanganese oxide  $\text{Co}_{0.95}\text{LiMn}_{0.05}\text{O}_2$  145896-60-2, Aluminum lithium manganese oxide  $\text{Al}_{0.2}\text{LiMn}_{1.8}\text{O}_4$  175786-46-6, Lithium magnesium manganese oxide 184092-89-5, Cobalt lithium titanium oxide  $\text{Co}_{0.95}\text{LiTi}_{0.05}\text{O}_2$  186298-17-9, Aluminum cobalt lithium manganese nickel oxide 193216-10-3, Aluminum cobalt lithium manganese nickel oxide  $\text{Al}_{0.1}\text{Co}_{0.1}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$  347175-77-3, Aluminum Lithium magnesium manganese oxide 372491-83-3, Aluminum cobalt lithium magnesium oxide  $\text{Al}_{0.01}\text{Co}_{0.94}\text{LiMg}_{0.05}\text{O}_2$  433969-25-6, Aluminum Cobalt lithium magnesium manganese nickel oxide 478037-17-1, Cobalt lithium magnesium manganese nickel oxide 642999-49-3, Aluminum cobalt lithium magnesium oxide 709654-46-6 709654-47-7, Aluminum cobalt lithium oxide  $(\text{Al}_{0.05}\text{Co}_{0.9}\text{LiO}_2)$  709654-48-8, Cobalt lithium magnesium manganese oxide  $(\text{Co}_{0.94}\text{LiMg}_{0.05}\text{Mn}_{0.01}\text{O}_2)$  709654-49-9, Cobalt lithium magnesium titanium oxide  $(\text{Co}_{0.94}\text{LiMg}_{0.05}\text{Ti}_{0.01}\text{O}_2)$  709654-50-2, Cobalt lithium manganese titanium oxide  $(\text{Co}_{0.95}\text{LiMn}_{0.02}\text{Ti}_{0.02}\text{O}_2)$  709654-51-3, Aluminum cobalt lithium manganese oxide  $(\text{Al}_{0.02}\text{Co}_{0.95}\text{LiMn}_{0.02}\text{O}_2)$

RL: DEV (Device component use); USES (Uses)

(nonaq. electrolyte rechargeable battery)

L3 ANSWER 89 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:392766 CAPLUS

DOCUMENT NUMBER: 140:393381

TITLE: Lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries

INVENTOR(S): Paulsen, Jens-Martin; Lee, Ki-young; Bae, Joon-sang; Kim, Mun-ju

PATENT ASSIGNEE(S): Lg Chem, Ltd., S. Korea

SOURCE: PCT Int. Appl., 52 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004040677	A1	20040513	WO 2003-KR2304	20031030
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
NZ 520452	A	20050324	NZ 2002-520452	20021031
AU 2003274784	A1	20040525	AU 2003-274784	20031030
EP 1556915	A1	20050727	EP 2003-759034	20031030
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			

CN 1708867	A	20051214	CN 2003-80102607	20031030
JP 2006503789	T2	20060202	JP 2004-548141	20031030
US 2006105239	A1	20060518	US 2005-533496	20050429
PRIORITY APPLN. INFO.:			NZ 2002-520452	A 20021031
			WO 2003-KR2304	W 20031030

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries

AB Disclosed are primary materials, precursor materials and final materials, as well as methods to prepare these materials. The final materials are mixed lithium transition metal oxides, useful as performance optimized cathode materials for rechargeable lithium batteries. The transition metal is a solid solution mixture of manganese, nickel and cobalt,  $M = (Mn_{1-u}Ni_u)_{1-y}Co_y$ , with  $0.2 < u < 0.7$  and  $0.1 < y < 0.9$  where the transition metal composition of cobalt, as well of manganese-nickel changes significantly from the inner bulk towards the outer bulk. This allows to account for different performance requirements of inner bulk, outer bulk and surface. The final materials are prepared by solid state reaction from precursor materials, which are prepared from primary materials. The primary materials can contain addnl. anions or cations. The primary materials are prepared by a copptn. reaction, where a hydroxide or carbonate based transition metal compound is precipitated onto the surface of seed-particles, the precipitation being characterized by a transition metal composition of the precipitate that differs significantly from the transition metal composition of the seed-particles.

ST battery cathode lithium transition metal oxide

IT Battery cathodes  
Heat treatment  
Precipitation (chemical)  
Solid state reaction  
(lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries)

IT Transition metal oxides  
RL: DEV (Device component use); USES (Uses)  
(lithium-containing; lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries)

IT Secondary batteries  
(lithium; lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries)

IT 37348-84-8, Cobalt manganese nickel oxide  
RL: DEV (Device component use); USES (Uses)  
(lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries)

IT 193215-96-2P, Cobalt lithium manganese nickel oxide  
Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub> 227623-80-5P, Cobalt lithium manganese nickel oxide  
Co<sub>0.8</sub>LiMn<sub>0.1</sub>Ni<sub>0.1</sub>O<sub>2</sub> 244129-80-4P, Manganese nickel hydroxide  
Mn<sub>0.5</sub>Ni<sub>0.5</sub>(OH)<sub>2</sub> 686740-96-5P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.67</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>) 686740-97-6P, Cobalt lithium manganese nickel oxide (Co<sub>0.17</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>) 686740-98-7P, Cobalt manganese nickel hydroxide oxide (Co<sub>0.17</sub>Mn<sub>0.42</sub>Ni<sub>0.42</sub>(OH)O) 686740-99-8P, Cobalt manganese nickel hydroxide oxide (Co<sub>0.67</sub>Mn<sub>0.17</sub>Ni<sub>0.17</sub>(OH)O)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries)

IT 14808-79-8, Sulfate, uses 16887-00-6, Chloride, uses 16984-48-8, Fluoride, uses 17341-24-1, uses 17341-25-2, Sodium ion, uses 24203-36-9, Potassium ion, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(lithium transition metal oxide with gradient of metal composition for cathode of lithium secondary batteries)

L3 ANSWER 90 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:392154 CAPLUS

DOCUMENT NUMBER: 140:393378

TITLE: Layered cathode materials for lithium ion rechargeable

INVENTOR(S): batteries  
 Kang, Sun-ho; Amine, Khalil  
 PATENT ASSIGNEE(S): The University of Chicago, USA  
 SOURCE: U.S. Pat. Appl. Publ., 24 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004091779	A1	20040513	US 2003-699484	20031031
US 2005058588	A1	20050317	US 2004-903514	20040730
PRIORITY APPLN. INFO.:			US 2002-423347P	P 20021101
			US 2003-699484	A2 20031031

TI Layered cathode materials for lithium ion rechargeable batteries

AB A number of materials are disclosed with the composition  $\text{Li}_{1+x}\text{Ni}_\alpha\text{Mn}_\beta\text{Co}_\gamma\text{M}'\text{SO}_2\text{-zFz}$  ( $\text{M}' = \text{Mg, Zn, Al, Ga, B, Zr, Ti}$ ) for use with rechargeable batteries, wherein x is between about 0 and 0.3,  $\alpha$  is between about 0.2 and 0.6,  $\beta$  is between about 0.2 and 0.6,  $\gamma$  is between about 0 and 0.3,  $\delta$  is between about 0 and 0.15, and z is between about 0 and 0.2. Adding the above metal and fluorine dopants affects capacity, impedance, and stability of the layered oxide structure during electrochem. cycling.

ST layered cathode material lithium rechargeable battery

IT Battery cathodes  
 Calcination  
 Heat treatment  
 Sol-gel processing  
 Solid state reaction  
 (layered cathode materials for lithium ion rechargeable batteries)

IT Materials  
 (layered; layered cathode materials for lithium ion rechargeable batteries)

IT Secondary batteries  
 (lithium; layered cathode materials for lithium ion rechargeable batteries)

IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-28-0, Thallium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (coating; layered cathode materials for lithium ion rechargeable batteries)

IT 373-02-4, Nickel acetate 546-89-4, Lithium acetate 555-31-7, Aluminum isopropoxide 1184-55-0, Zinc methoxide 1309-42-8, Magnesium hydroxide 1310-65-2, Lithium hydroxide 2180-18-9, Manganese acetate 5931-89-5, Cobalt acetate 7779-88-6, Zinc nitrate 7789-24-4, Lithium fluoride, processes 10377-60-3, Magnesium nitrate 12023-99-3, Gallium hydroxide 12054-48-7, Nickel hydroxide 12672-51-4, Cobalt hydroxide 13473-90-0, Aluminum nitrate 13494-90-1, Gallium nitrate 20427-58-1, Zinc hydroxide 21645-51-2, Aluminum hydroxide, processes 38218-24-5, Indium isopropoxide  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (layered cathode materials for lithium ion rechargeable batteries)

IT 128975-24-6, Lithium manganese nickel oxide  $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$  685867-50-9, Lithium manganese nickel fluoride oxide ( $\text{Li}_{1-1.33}\text{Mn}_{0.2-0.67}\text{Ni}_{0.2-0.6}\text{F}_{0-0.5}\text{O}_{1.5-2}$ ) 685867-51-0 685867-52-1 685867-54-3 685867-55-4 685867-56-5 685867-57-6 685867-58-7, Lithium manganese nickel fluoride oxide ( $\text{LiMn}_{0.48}\text{Ni}_{0.52}\text{F}_{0.05}\text{O}_{1.95}$ ) 685867-60-1, Lithium manganese nickel fluoride oxide



(LiMn<sub>0.49</sub>Ni<sub>0.51</sub>F<sub>0.02</sub>O<sub>1.98</sub>) 685867-61-2, Lithium manganese nickel  
 fluoride oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>F<sub>0.01</sub>O<sub>1.99</sub>) 685867-62-3, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.2</sub>Mn<sub>0.55</sub>Ni<sub>0.15</sub>O<sub>2</sub>) 685867-63-4  
 685867-64-5 685867-66-7  
 RL: DEV (Device component use); USES (Uses)  
 (layered cathode materials for lithium ion rechargeable  
 batteries)

L3 ANSWER 91 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:331015 CAPLUS  
 DOCUMENT NUMBER: 140:342184  
 TITLE: Secondary nonaqueous electrolyte battery  
 INVENTOR(S): Toriyama, Junichi  
 PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004127694	A2	20040422	JP 2002-289606	20021002
PRIORITY APPLN. INFO.:			JP 2002-289606	20021002
TI Secondary nonaqueous electrolyte battery				
AB The battery uses LiNi <sub>1-x-y</sub> CoxMnyO <sub>2</sub> coated LiNi <sub>1-z</sub> Al <sub>x</sub> O <sub>2</sub> (0.01≤z≤0.1) powder as cathode active mass.				
ST secondary battery aluminum lithium nickel oxide cathode; lithium cobalt manganese oxide coating battery cathode				
IT Battery cathodes (aluminum lithium nickel oxide powder with cobalt lithium manganese nickel oxide coating for secondary lithium battery cathodes)				
IT 164175-46-6, Aluminum lithium nickel oxide (Al <sub>0.05</sub> LiNi <sub>0.95</sub> O <sub>2</sub> ) RL: DEV (Device component use); USES (Uses) (aluminum lithium nickel oxide powder with cobalt lithium manganese nickel oxide coating for secondary lithium battery cathodes)				
IT 176206-89-6, Cobalt lithium manganese nickel oxide (Co <sub>0.3</sub> LiMn <sub>0.2</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 193215-00-8, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.2</sub> Ni <sub>0.7</sub> O <sub>2</sub> ) 193215-05-3, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.2</sub> Ni <sub>0.6</sub> O <sub>2</sub> ) 193215-50-8, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.3</sub> Ni <sub>0.6</sub> O <sub>2</sub> ) 193215-53-1, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.3</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 193215-92-8, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.4</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 193215-96-2, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.4</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) 217309-43-8, Cobalt lithium manganese nickel oxide (Co <sub>0.3</sub> LiMn <sub>0.3</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) 681160-59-8, Cobalt lithium manganese nickel oxide (Co <sub>0.3</sub> LiMn <sub>0.4</sub> Ni <sub>0.3</sub> O <sub>2</sub> ) RL: MOA (Modifier or additive use); USES (Uses) (aluminum lithium nickel oxide powder with cobalt lithium manganese nickel oxide coating for secondary lithium battery cathodes)				

L3 ANSWER 92 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:291678 CAPLUS  
 DOCUMENT NUMBER: 140:324162  
 TITLE: Cathode active mass containing lithium mixed oxide and  
 secondary nonaqueous-electrolyte battery  
 INVENTOR(S): Sato, Takashi; Yamamoto, Yoshikatsu; Hosoya, Yosuke  
 PATENT ASSIGNEE(S): Sony Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004111076	A2	20040408	JP 2002-268357	20020913
PRIORITY APPLN. INFO.:			JP 2002-268357	20020913

TI Cathode active mass containing lithium mixed oxide and secondary nonaqueous-electrolyte battery

AB The cathode active mass contains Li mixed oxides represented as  $\text{Li}_x\text{Ni}_{(1-y-z)}\text{Co}_y\text{Mn}_z\text{AaO}_2$  (A = Fe, V, Cr, Mn, Ti, Mg, Al, B, and/or Ca;  $x = 0.05-1.10$ ;  $y + z = 0.10-0.70$ ;  $z = 0.05-0.40$ ;  $a = 0-0.1$ ) and having electron conductivity  $\sigma$   $10^{-4}$ - $10^{-1}$  S/cm. The battery equipped with the active mass provides high capacity and long cycle life.

ST lithium nickel cobalt manganese mixed oxide cathode secondary battery

IT Battery cathodes  
(cathode containing lithium nickel cobalt manganese mixed oxide for secondary nonaq.-electrolyte battery)

IT Secondary batteries  
(lithium; cathode containing lithium nickel cobalt manganese mixed oxide for secondary nonaq.-electrolyte battery)

IT 677311-85-2, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.05}\text{Li}_{0.05}-1.1\text{Mn}_{0.05}\text{Ni}_{0.90}\text{O}_2$ ) 677311-88-5, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.65}\text{Li}_{0.05}-1.1\text{Mn}_{0.05}\text{Ni}_{0.30}\text{O}_2$ ) 677311-91-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.05}\text{Li}_{0.05}-1.1\text{Mn}_{0.4}\text{Ni}_{0.55}\text{O}_2$ ) 677311-94-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{Li}_{0.05}-1.1\text{Mn}_{0.4}\text{Ni}_{0.30}\text{O}_2$ )  
RL: DEV (Device component use); USES (Uses)  
(cathode containing lithium nickel cobalt manganese mixed oxide for secondary nonaq.-electrolyte battery)

L3 ANSWER 93 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:210583 CAPLUS

DOCUMENT NUMBER: 141:26047

TITLE: Effect of Co Content on Rate Performance of  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  Cathode Materials for Lithium-Ion Batteries

AUTHOR(S): Sun, Yucheng; Ouyang, Chuying; Wang, Zhaoxiang; Huang, Xuejie; Chen, Liquan

CORPORATE SOURCE: Institute of Physics, Nanoscale Physics and Device Laboratory, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China

SOURCE: Journal of the Electrochemical Society (2004), 151(4), A504-A508  
CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Effect of Co Content on Rate Performance of  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  Cathode Materials for Lithium-Ion Batteries

AB Layer-structured  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  was prepared as cathode material for Li-ion batteries. The structure of the layered materials and the oxidation state of the elements in the compds. were characterized by XRD and XPS. Adsorbed O was detected on the surface of material. With an increase of the Co content in  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$ , the oxidation state of Ni, Mn, Co, and O gradually increases while the amount of O adsorbed on the surface of the  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  grains decreased. Electrochem. evaluation showed that addition of Co to  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  improves its rate performance. The variation of the electronic structure of Ni, Mn, and O may be responsible for the improvement of the rate capability of  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  with the addition of Co.

ST cobalt lithium manganese nickel oxide cathode lithium battery

IT Battery cathodes  
(effect of Co content on charge-discharge rate of  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  cathode material for lithium-ion batteries)

IT Secondary batteries  
(lithium; effect of Co content on charge-discharge rate of  $\text{LiMn}_{0.5}\text{-xCo}_2\text{xNi}_{0.5}\text{-xO}_2$  cathode material for lithium-ion)

batteries)

IT 128975-24-6, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
 193215-96-2, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 390362-01-3, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.5</sub>LiMn<sub>0.25</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 404904-11-6, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.4</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 405890-05-3, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 468772-63-6, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.38</sub>Ni<sub>0.38</sub>O<sub>2</sub>) 493394-61-9,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.35</sub>Ni<sub>0.35</sub>O<sub>2</sub>)  
 697766-76-0, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.15</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (effect of Co content on charge-discharge rate of LiMn<sub>0.5</sub>-xCo<sub>2</sub>xNi<sub>0.5</sub>-  
 xO<sub>2</sub> cathode material for lithium-ion batteries)

IT 7440-48-4, Cobalt, occurrence  
 RL: OCU (Occurrence, unclassified); OCCU (Occurrence)  
 (effect of Co content on charge-discharge rate of LiMn<sub>0.5</sub>-xCo<sub>2</sub>xNi<sub>0.5</sub>-  
 xO<sub>2</sub> cathode material for lithium-ion batteries)

L3 ANSWER 94 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:77097 CAPLUS

DOCUMENT NUMBER: 140:131102

TITLE: Secondary nonaqueous electrolyte battery

INVENTOR(S): Tsutsumi, Shuji; Nagura, Kensuke; Takeno, Mitsuhiro;  
 Oura, Takafumi; Okamura, Kazuhiro

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.  
 CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004031091	A2	20040129	JP 2002-184961	20020625
PRIORITY APPLN. INFO.:			JP 2002-184961	20020625

TI Secondary nonaqueous electrolyte battery

AB The battery has an anode containing an anode active mass, a cathode  
 containing a cathode active mass, and a nonaq. electrolyte solution; where the  
 anode active mass is a graphite material or a graphitization resistant  
 carbonaceous material; and the cathode active mass is Li<sub>x</sub>Ni<sub>1-y-z</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub>  
 (0 < y ≤ 0.5; 0 < z ≤ 0.5; 0 < y+z ≤ 0.75) and satisfies  
 (z/x) ≤ 1 in a charged state.

ST secondary lithium battery cathode lithium cobalt nickel  
 manganese oxide

IT Secondary batteries  
 (lithium; secondary lithium batteries containing lithium cobalt  
 nickel manganese oxides in cathodes for long life)

IT Battery cathodes  
 (secondary lithium batteries containing lithium cobalt nickel  
 manganese oxides in cathodes for long life)

IT 7782-42-5, Graphite, uses 179802-95-0, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.1</sub>LiMn<sub>0.1</sub>Ni<sub>0.8</sub>O<sub>2</sub>) 193215-05-3, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.2</sub>LiMn<sub>0.2</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-96-2, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 217309-43-8, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 244304-31-2, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.01</sub>LiMn<sub>0.01</sub>Ni<sub>0.98</sub>O<sub>2</sub>) 390362-01-3, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.5</sub>LiMn<sub>0.25</sub>Ni<sub>0.25</sub>O<sub>2</sub>) 404904-11-6,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>)  
 405890-05-3, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 493394-61-9, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.3</sub>LiMn<sub>0.35</sub>Ni<sub>0.35</sub>O<sub>2</sub>) 632287-14-0, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.02</sub>LiMn<sub>0.49</sub>Ni<sub>0.49</sub>O<sub>2</sub>) 632287-15-1, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.5</sub>Ni<sub>0.25</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)

(secondary lithium batteries containing lithium cobalt nickel  
manganese oxides in cathodes for long life)

L3 ANSWER 95 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:13596 CAPLUS  
DOCUMENT NUMBER: 140:273457  
TITLE: The synthesis, characterization and electrochemical  
behavior of the layered  $\text{LiNi}_{0.4}\text{Mn}_{0.4}\text{Co}_{0.2}\text{O}_2$  compound  
AUTHOR(S): Ngala, J. Katana; Chernova, Natasha A.; Ma, Miaomiao;  
Mamak, Marc; Zavalij, Peter Y.; Whittingham, M.  
Stanley  
CORPORATE SOURCE: Department of Chemistry and Institute for Materials  
Research, State University of New York at Binghamton,  
Binghamton, NY, 13902-6000, USA  
SOURCE: Journal of Materials Chemistry (2004), 14(2), 214-220  
CODEN: JMACEP; ISSN: 0959-9428  
PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
ST electrochem intercalation layered compd mixed transition metal oxide  
paramagnetism; cobalt lithium manganese nickel oxide battery  
cathode crystal structure  
IT Secondary batteries  
(lithium; synthesis, characterization and electrochem. behavior of  
layered  $\text{LiNi}_{0.4}\text{Mn}_{0.4}\text{Co}_{0.2}\text{O}_2$  compound)  
IT Battery cathodes  
Current density  
Electric capacitance  
Intercalation  
Ion exchange  
Paramagnetism  
(synthesis, characterization and electrochem. behavior of layered  
 $\text{LiNi}_{0.4}\text{Mn}_{0.4}\text{Co}_{0.2}\text{O}_2$  compound)  
IT 674779-54-5P, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.2}\text{Li}_{0.94}\text{Mn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) 674779-56-7P, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.2}\text{Li}_{0.5}\text{Mn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ )  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(electrochem. delithiated; synthesis, characterization and electrochem.  
behavior of layered  $\text{LiNi}_{0.4}\text{Mn}_{0.4}\text{Co}_{0.2}\text{O}_2$  compound)  
IT 12031-65-1P, Lithium nickel oxide ( $\text{LiNiO}_2$ ) 128975-24-6P, Lithium  
manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 146956-42-5P, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.2}\text{Ni}_{0.4}\text{O}_2$ ) 193215-50-8P, Cobalt  
lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.3}\text{Ni}_{0.6}\text{O}_2$ ) 193215-96-2P  
, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ )  
217309-43-8P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.3}\text{Ni}_{0.4}\text{O}_2$ )  
404904-11-6P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ )  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(synthesis, characterization and electrochem. behavior of layered  
 $\text{LiNi}_{0.4}\text{Mn}_{0.4}\text{Co}_{0.2}\text{O}_2$  compound)

L3 ANSWER 96 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:971365 CAPLUS  
DOCUMENT NUMBER: 140:29507  
TITLE: Lithium cobalt manganese nickel oxide as novel cathode  
material for secondary batteries  
INVENTOR(S): Nakura, Kensuke; Oura, Takafumi; Takeno, Mitsuhiro;  
Tsutsumi, Shuji; Okamura, Kazuhiro  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: U.S. Pat. Appl. Publ., 20 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003228519	A1	20031211	US 2003-447011	20030528
JP 2004055539	A2	20040219	JP 2003-151068	20030528
CN 1462085	A	20031217	CN 2003-138407	20030529
PRIORITY APPLN. INFO.:			JP 2002-157167	A 20020530

TI Lithium cobalt manganese nickel oxide as novel cathode material for secondary batteries

AB A nonaq.-electrolyte secondary battery has as a novel cathode material cobalt lithium manganese nickel composite oxide of general formula  $\text{LiNi}_{1-y-z}\text{Mn}_y\text{Co}_z\text{O}_2$ , in which  $y = 0-0.5$ ,  $z = 0-0.5$ , and  $y + z = 0-0.75$ . Charging of the battery is carried out at an upper voltage limit of 4.25-4.70 V. A suitable battery for this cathode material is a graphite anode, an electrolyte of ethylene carbonate-Me Et carbonate-LiPF<sub>6</sub>.

ST nonaq electrolyte secondary battery cathode composite oxide; lithium cobalt manganese nickel oxide battery cathode

IT Battery cathodes  
(graphite; lithium cobalt manganese nickel oxide as novel cathode material for secondary batteries)

IT Battery anodes  
(lithium cobalt manganese nickel oxide as novel cathode material for secondary batteries)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 72785-69-4  
RL: DEV (Device component use); USES (Uses)  
(anode; lithium cobalt manganese nickel oxide as novel cathode material for secondary batteries)

IT 128975-24-6, Lithium manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ )  
144973-42-2, Lithium manganese nickel oxide ( $\text{LiMn}_{0.3}\text{Ni}_{0.7}\text{O}_2$ )  
149887-20-7, Lithium manganese nickel oxide ( $\text{LiMn}_{0.1}\text{Ni}_{0.9}\text{O}_2$ )  
163596-49-4, Lithium manganese nickel oxide ( $\text{LiMn}_{0.2}\text{Ni}_{0.8}\text{O}_2$ )  
179186-44-8, Lithium manganese nickel oxide ( $\text{LiMn}_{0.4}\text{Ni}_{0.6}\text{O}_2$ )  
179802-95-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.1}\text{Ni}_{0.8}\text{O}_2$ )  
193215-05-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.2}\text{Ni}_{0.6}\text{O}_2$ )  
193215-96-2, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.2}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) 217309-43-8, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.3}\text{LiMn}_{0.3}\text{Ni}_{0.4}\text{O}_2$ ) 244304-31-2, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.01}\text{LiMn}_{0.01}\text{Ni}_{0.98}\text{O}_2$ ) 390362-01-3, Cobalt lithium manganese nickel  
oxide ( $\text{Co}_{0.5}\text{LiMn}_{0.25}\text{Ni}_{0.25}\text{O}_2$ ) 404904-11-6, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ ) 405890-05-3, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 493394-61-9, Cobalt  
lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.35}\text{Ni}_{0.35}\text{O}_2$ ) 632287-13-9,  
Lithium manganese nickel oxide ( $\text{LiMn}_{0.01}\text{Ni}_{0.99}\text{O}_2$ ) 632287-14-0,  
Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.02}\text{LiMn}_{0.49}\text{Ni}_{0.49}\text{O}_2$ )  
632287-15-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.25}\text{LiMn}_{0.5}\text{Ni}_{0.25}\text{O}_2$ )  
RL: DEV (Device component use); USES (Uses)  
(cathode; lithium cobalt manganese nickel oxide as novel cathode material for secondary batteries)

IT 96-49-1, Ethylene carbonate 623-53-0, Methyl ethyl carbonate  
21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte; lithium cobalt manganese nickel oxide as novel cathode material for secondary batteries)

L3 ANSWER 97 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:778144 CAPLUS

DOCUMENT NUMBER: 139:294648

TITLE: Lithium secondary battery comprising overdischarge-preventing agent

INVENTOR(S): Goh, Eun-Young; Hong, Seung-Tae; Kim, Hyoung-Jin; Lee, Hyung-Keun

PATENT ASSIGNEE(S): LG Chem, Ltd., S. Korea

SOURCE: PCT Int. Appl., 25 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003081697	A1	20031002	WO 2002-KR2267	20021202
W: CN, JP, US				
RW: DE, FI, FR, IT, SE, SI				
KR 2003076153	A	20030926	KR 2002-36438	20020627
CN 1518777	A	20040804	CN 2002-812484	20021202
EP 1490916	A1	20041229	EP 2002-791014	20021202
R: DE, FR, IT, SE, SI, FI				
JP 2005521220	T2	20050714	JP 2003-579299	20021202
US 2004157124	A1	20040812	US 2003-478802	20031125
US 2005118496	A1	20050602	US 2004-950104	20040924
PRIORITY APPLN. INFO.:				
			KR 2002-15713	A 20020322
			KR 2002-36438	A 20020627
			WO 2002-KR2267	W 20021202
			KR 2003-66865	A 20030926
			KR 2003-66866	A 20030926
			US 2003-478802	A2 20031125
REFERENCE COUNT:	4	THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		
TI	Lithium secondary battery comprising overdischarge-preventing agent			
AB	The present invention relates to a lithium secondary battery comprising an overdischarge-preventing agent. Particularly, the present invention provides a lithium secondary battery comprising an overdischarge-preventing agent having superior effects for an overdischarge test and showing 90% or more capacity recovery after the test, by introducing lithium nickel oxide into a cathode for a lithium secondary battery comprising a lithium transition metal oxide capable of occluding and releasing lithium ions as an overdischarge-preventing agent to supply lithium ions such that irreversible capacity of an anode can be compensated or better, thereby lowering voltage of a cathode first to prevent voltage increase of an anode during the overdischarge test.			
ST	lithium secondary battery overdischarge preventing agent			
IT	Transition metal oxides			
	RL: MOA (Modifier or additive use); USES (Uses) (lithiated; lithium secondary battery comprising overdischarge-preventing agent)			
IT	Alloys, uses			
	RL: DEV (Device component use); USES (Uses) (lithium secondary battery comprising overdischarge-preventing agent)			
IT	Secondary batteries			
	(lithium; lithium secondary battery comprising overdischarge-preventing agent)			
IT	96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7791-03-9, Lithium perchlorate 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12162-79-7, Lithium manganese oxide limno2 12190-79-3, Cobalt lithium oxide colio2 13824-63-0, Cobalt lithium phosphate colipo4 14283-07-9, Lithium tetrafluoroborate 15365-14-7, Iron lithium phosphate felipo4 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9, Methyl propyl carbonate 90076-65-6 135573-53-4, Cobalt lithium nickel oxide Co0-1LiNi0-102 188651-74-3, Cobalt lithium manganese oxide ((Co,Mn)2LiO4) 188651-75-4, Lithium manganese nickel oxide (Li(Mn,Ni)2O4) 253875-65-9, Cobalt lithium manganese oxide ((Co,Mn)LiO2) 600177-49-9, Lithium manganese nickel oxide (Li(Mn,Ni)O2) 607706-60-5, Lithium manganese nickel oxide (Li2(Mn,Ni)O2) 607706-61-6, Iron lithium			

nickel oxide ((Fe,Ni)Li2O2) 607706-62-7, Cobalt lithium nickel oxide ((Co,Ni)Li2O2) 607706-63-8, Copper lithium nickel oxide ((Cu,Ni)Li2O2) 607706-64-9, Lithium nickel zinc oxide (Li2(Ni,Zn)O2) 607706-65-0, Lithium magnesium nickel oxide (Li2(Mg,Ni)O2) 607706-66-1, Cadmium lithium nickel oxide ((Cd,Ni)Li2O2) 607706-67-2, Cobalt lithium manganese nickel oxide ((Co,Mn,Ni)Li2O2) 607706-68-3, Cobalt lithium manganese nickel oxide ((Co,Mn,Ni)2LiO4)

RL: DEV (Device component use); USES (Uses)  
(lithium secondary battery comprising overdischarge-preventing agent)

IT 12325-84-7, Lithium nickel oxide li2nio2  
RL: MOA (Modifier or additive use); USES (Uses)  
(lithium secondary battery comprising overdischarge-preventing agent)

L3 ANSWER 98 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:757157 CAPLUS

DOCUMENT NUMBER: 139:263346

TITLE: Method for preparing cathode active material for nonaqueous secondary battery

INVENTOR(S): Nakane, Kenji; Inukai, Hiroshi

PATENT ASSIGNEE(S): Sumitomo Chemical Company, Limited, Japan

SOURCE: U.S. Pat. Appl. Publ., 14 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003180620	A1	20030925	US 2003-394049	20030324
EP 1357616	A1	20031029	EP 2003-5413	20030313
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2004006267	A2	20040108	JP 2003-77386	20030320
CA 2423051	AA	20030925	CA 2003-2423051	20030321
CN 1447462	A	20031008	CN 2003-107945	20030325
JP 2004152753	A2	20040527	JP 2003-350447	20031009
PRIORITY APPLN. INFO.:			JP 2002-82968	A 20020325
			JP 2002-297239	A 20021010

TI Method for preparing cathode active material for nonaqueous secondary battery

AB There is provided a simple and easy method of preparation of a pos. electrode active material for a nonaq. secondary battery which comprises a compound comprising lithium, nickel and manganese and having a layered structure. The method comprises firing a mixture of (1) at least one member selected from the group consisting of dinickel trioxide and boron compds. and (2) one or more metal compds. comprising lithium, nickel and manganese as their metal elements.

ST cathode active material prepn nonaq secondary battery

IT Materials  
(layered; method for preparing cathode active material for nonaq. secondary battery)

IT Secondary batteries  
(lithium; method for preparing cathode active material for nonaq. secondary battery)

IT Battery cathodes  
(method for preparing cathode active material for nonaq. secondary battery)

IT 1310-65-2, Lithium hydroxide (Li(OH)) 1314-06-3, Dinickel trioxide 7439-96-5D, Manganese, compound 7440-02-0D, Nickel, compound 17375-37-0, Manganese carbonate

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(method for preparing cathode active material for nonaq. secondary

battery)

IT 96-49-1, Ethylene carbonate 115-07-1, Propylene, uses 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7439-93-2, Lithium, uses 21324-40-3, Lithium hexafluorophosphate 128975-24-6, Lithium manganese nickel oxide  $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$  603961-33-7, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.04}\text{Mn}_{0.42}\text{Ni}_{0.34}\text{O}_2$ ) 603961-35-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.06}\text{Mn}_{0.43}\text{Ni}_{0.31}\text{O}_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (method for preparing cathode active material for nonaq. secondary battery)

IT 193215-96-2P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ )  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (method for preparing cathode active material for nonaq. secondary battery)

IT 7439-93-2D, Lithium, compound 7440-42-8D, Boron, compound  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (method for preparing cathode active material for nonaq. secondary battery)

L3 ANSWER 99 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:757155 CAPLUS  
 DOCUMENT NUMBER: 139:263345  
 TITLE: Nonaqueous electrolyte secondary battery  
 INVENTOR(S): Fujimoto, Hiroyuki; Fujihara, Toyoki; Kamino, Maruo  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 8 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003180617	A1	20030925	US 2003-390722	20030319
JP 2003282048	A2	20031003	JP 2002-79944	20020322
JP 3744870	B2	20060215		
CN 1447465	A	20031008	CN 2003-107286	20030321
PRIORITY APPLN. INFO.:			JP 2002-79944	A 20020322

TI Nonaqueous electrolyte secondary battery  
 AB A nonaq. electrolyte secondary battery includes a pos. electrode comprising a pos. electrode material attached to a pos. electrode current collector, a neg. electrode and a nonaq. electrolyte, wherein the pos. electrode material comprises a pos. electrode active material represented by  $\text{Li}_a\text{Mn}_b\text{Ni}_c\text{Co}_{1-2b}\text{O}_2$  (wherein a is  $0 \leq a \leq 1.1$ , and b is  $0 < b \leq 0.5$ ), a binder and an elec. conductive agent, wherein the binder is contained in the pos. electrode material in a range of 0.8-3 weight%, and the d. of the pos. electrode material is not less than 3.0 g/cm<sup>3</sup>

ST cathode improvement nonaq electrolyte secondary battery  
 IT Battery cathodes  
 Secondary batteries  
 (improved cathode for nonaq. electrolyte secondary battery)

IT Carbon black, uses  
 Fluoropolymers, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (improved cathode for nonaq. electrolyte secondary battery)

IT 1310-65-2, Lithium hydroxide 244129-80-4, Manganese nickel hydroxide  $\text{Mn}_{0.5}\text{Ni}_{0.5}(\text{OH})_2$  602297-52-9, Cobalt manganese nickel hydroxide ( $\text{Co}_{0.33}\text{Mn}_{0.33}\text{Ni}_{0.33}(\text{OH})_2$ ) 602297-53-0, Cobalt manganese nickel hydroxide ( $\text{Co}_{0.2}\text{Mn}_{0.4}\text{Ni}_{0.4}(\text{OH})_2$ )  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (improved cathode for nonaq. electrolyte secondary battery)



IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 182442-95-1,  
Cobalt lithium manganese nickel oxide  
RL: DEV (Device component use); USES (Uses)  
(improved cathode for nonaq. electrolyte secondary battery)

IT 128975-24-6P, Lithium Manganese nickel oxide  $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$   
193215-96-2P, Cobalt lithium manganese nickel oxide  
 $\text{Co}_{0.2}\text{LiMn}_{0.4}\text{Ni}_{0.4}\text{O}_2$  346417-97-8P, Cobalt lithium manganese nickel oxide  
 $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$   
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(improved cathode for nonaq. electrolyte secondary battery)

IT 24937-79-9, PvdF  
RL: MOA (Modifier or additive use); USES (Uses)  
(improved cathode for nonaq. electrolyte secondary battery)

L3 ANSWER 100 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:727463 CAPLUS  
DOCUMENT NUMBER: 139:352617  
TITLE: Morphology and Safety of  $\text{Li}[\text{NixCo}_{1-2x}\text{Mnx}]\text{O}_2$  series  
( $0 \leq x \leq 1/2$ )  
AUTHOR(S): Jouanneau, S.; MacNeil, D. D.; Lu, Z.; Beattie, S. D.;  
Murphy, G.; Dahn, J. R.  
CORPORATE SOURCE: Department of Chemistry, Dalhousie University,  
Halifax, NS, B3H3J5, Can.  
SOURCE: Journal of the Electrochemical Society (2003),  
150(10), A1299-A1304  
CODEN: JESOAN; ISSN: 0013-4651  
PUBLISHER: Electrochemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST cobalt lithium manganese nickel oxide cathode morphol safety  
battery

IT Secondary batteries  
(lithium; morphol. and safety of  $\text{Li}[\text{NixCo}_{1-2x}\text{Mnx}]\text{O}_2$  cathodes for  
lithium batteries)

IT Battery cathodes  
Crystal morphology  
Safety  
(morphol. and safety of  $\text{Li}[\text{NixCo}_{1-2x}\text{Mnx}]\text{O}_2$  cathodes for lithium  
batteries)

IT 12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 128975-24-6, Lithium manganese  
nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 214473-76-4, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.9}\text{LiMn}_{0.05}\text{Ni}_{0.05}\text{O}_2$ ) 390362-01-3, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.5}\text{LiMn}_{0.25}\text{Ni}_{0.25}\text{O}_2$ ) 404904-11-6, Cobalt  
lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ ) 405890-05-3  
, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ )  
468772-63-6, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.25}\text{LiMn}_{0.38}\text{Ni}_{0.38}\text{O}_2$ ) 479624-33-4, Cobalt lithium manganese nickel  
oxide ( $\text{Co}_{0.98}\text{LiMn}_{0.01}\text{Ni}_{0.01}\text{O}_2$ ) 479624-34-5, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.95}\text{LiMn}_{0.02}\text{Ni}_{0.02}\text{O}_2$ ) 479624-35-6, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.85}\text{LiMn}_{0.08}\text{Ni}_{0.08}\text{O}_2$ ) 479624-36-7, Cobalt  
lithium manganese nickel oxide ( $\text{Co}_{0.7}\text{LiMn}_{0.15}\text{Ni}_{0.15}\text{O}_2$ )  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(morphol. and safety of  $\text{Li}[\text{NixCo}_{1-2x}\text{Mnx}]\text{O}_2$  cathodes for lithium  
batteries)

L3 ANSWER 101 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:596491 CAPLUS  
DOCUMENT NUMBER: 139:136094  
TITLE: Lithium containing multiple oxide and secondary  
nonaqueous battery using the oxide  
INVENTOR(S): Uchitomi, Kazutaka; Ueda, Atsushi; Aoyama, Shigeo  
PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

DOCUMENT TYPE: CODEN: JKXXAF  
 LANGUAGE: Patent  
 FAMILY ACC. NUM. COUNT: 1 Japanese  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003221236	A2	20030805	JP 2002-338430	20021121
US 2004110063	A1	20040610	US 2003-717772	20031120
PRIORITY APPLN. INFO.:			JP 2001-357729	A 20011122
			JP 2002-338430	A 20021121

TI Lithium containing multiple oxide and secondary nonaqueous battery using the oxide

AB The oxide is secondary particles of primary  $\text{Li}_{1-x+\alpha}\text{Ni}_{1-x-y+\delta}/2\text{Mn}_{1-x-y-\delta}/2\text{MyO}_2$  [M = Mg, Ti, Cr, Fe, Cp. Cu. Zm. Al, Ge, and/or Sn;  $x \leq 0.05$  ( $-0.05 \leq x + \alpha \leq 0.05$ ),  $y \leq 0.4$ ,  $\delta = (-0.1) - 0.1$  when  $y \leq 0.2$  or  $\delta = (-0.24) - 0.24$  when  $0.2 < y \leq 0.4$ ] particles, where the primary particles have average diameter 0.3-3  $\mu\text{m}$  and the secondary particles have average diameter 5-20  $\mu\text{m}$ . A secondary Li battery uses the oxide for its cathode active mass.

ST battery cathode active mass lithium manganese nickel oxide particle

IT Battery cathodes  
 (lithium manganese nickel oxide with controlled primary and secondary particle size for battery cathodes)

IT 128975-24-6, Lithium manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ )  
 346417-97-8, Cobalt lithium manganese nickel oxide  
 ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 532934-40-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.16}\text{LiMn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ )  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (lithium manganese nickel oxide with controlled primary and secondary particle size for battery cathodes)

L3 ANSWER 102 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:437424 CAPLUS

DOCUMENT NUMBER: 139:367347

TITLE: Performance of  $\text{LiFePO}_4$  as lithium battery cathode and comparison with manganese and vanadium oxides

AUTHOR(S): Yang, Shoufeng; Song, Yanning; Ngala, Katana; Zavalij, Peter Y.; Stanley Whittingham, M.

CORPORATE SOURCE: Department of Chemistry and Institute for Materials Research, State University of New York at Binghamton, Binghamton, NY, 13902-6000, USA

SOURCE: Journal of Power Sources (2003), 119-121, 239-246  
 CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Performance of  $\text{LiFePO}_4$  as lithium battery cathode and comparison with manganese and vanadium oxides

ST iron lithium phosphate manganese vanadium oxide cathode battery

IT Secondary batteries  
 (lithium; performance of cathode materials for lithium batteries)

IT Carbon black, uses  
 RL: DEV (Device component use); USES (Uses)  
 (performance of  $\text{LiFePO}_4$  ground with carbon black as cathode material for lithium batteries)

IT Battery cathodes  
 (performance of cathode materials for lithium batteries)

IT 15365-14-7, Iron lithium phosphate ( $\text{FeLiPO}_4$ )

RL: DEV (Device component use); USES (Uses)  
 (performance of LiFePO4 cathode material for lithium batteries  
 )

IT 620972-98-7, Cobalt lithium manganese nickel oxide  
 (Co0.2Li0-1Mn0.4Ni0.4O2)  
 RL: DEV (Device component use); USES (Uses)  
 (performance of LiMn0.4Co0.2Ni0.4O2 cathode material for lithium  
 batteries)

IT 39457-42-6, Lithium manganese oxide  
 RL: DEV (Device component use); USES (Uses)  
 (performance of LixMnO2 cathode material for lithium batteries  
 )

IT 151331-57-6D, Vanadate (V4O10-), ammonium manganese  
 RL: DEV (Device component use); USES (Uses)  
 (performance of ammonium manganese vanadium oxide cathode material for  
 lithium batteries)

IT 7440-44-0, Carbon, uses  
 RL: DEV (Device component use); USES (Uses)  
 (performance of carbon gel-coated LiFePO4 cathode material for lithium  
 batteries)

IT 56729-39-6, Manganese vanadium oxide  
 RL: DEV (Device component use); USES (Uses)  
 (performance of vanadium oxide pillared manganese oxide cathode  
 material for lithium batteries)

L3 ANSWER 103 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:437407 CAPLUS

DOCUMENT NUMBER: 139:278921

TITLE: Comparative study of Li(Ni0.5-xMn0.5-xM2x')O2 (M' =  
 Mg, Al, Co, Ni, Ti; x = 0, 0.025) cathode materials  
 for rechargeable lithium batteries

AUTHOR(S): Kang, S.-H.; Amine, K.

CORPORATE SOURCE: Chemical Technology Division, Electrochemical  
 Technology Program, Argonne National Laboratory,  
 Argonne, IL, 60439, USA

SOURCE: Journal of Power Sources (2003), 119-121, 150-155  
 CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Comparative study of Li(Ni0.5-xMn0.5-xM2x')O2 (M' = Mg, Al, Co, Ni, Ti; x  
 = 0, 0.025) cathode materials for rechargeable lithium batteries

ST lithium manganese nickel doped layered oxide cathode lithium  
 battery

IT Battery cathodes  
 (comparative study of doped lithium manganese nickel oxide cathode  
 materials for lithium batteries)

IT Secondary batteries  
 (lithium; comparative study of doped lithium manganese nickel oxide  
 cathode materials for lithium batteries)

IT 128975-24-6, Lithium manganese nickel oxide (LiMn0.5Ni0.5O2)  
 459408-74-3, Aluminum lithium manganese nickel oxide  
 (Al0.05LiMn0.48Ni0.48O2) 459408-75-4, Lithium magnesium manganese nickel  
 oxide (LiMg0.05Mn0.48Ni0.48O2) 459408-76-5, Cobalt lithium  
 manganese nickel oxide (Co0.05LiMn0.48Ni0.48O2) 459408-78-7, Lithium  
 manganese nickel titanium oxide (LiMn0.48Ni0.48Ti0.05O2) 541511-40-4,  
 Lithium manganese nickel oxide (LiMn0.48Ni0.52O2)  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (comparative study of doped lithium manganese nickel oxide cathode  
 materials for lithium batteries)

L3 ANSWER 104 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:418012 CAPLUS

DOCUMENT NUMBER: 139:9294

TITLE: Cathode active mass, the cathode, secondary lithium battery, and manufacture of the active mass and the battery

INVENTOR(S): Suzuki, Tadashi; Ogawa, Kazuya; Iijima, Tsuyoshi; Maruyama, Satoshi

PATENT ASSIGNEE(S): TDK Corporation, Japan

SOURCE: PCT Int. Appl., 74 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003044882	A1	20030530	WO 2002-JP12134	20021120
W: CN, JP, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
CN 1498432	A	20040519	CN 2002-807021	20021120
US 2004072072	A1	20040415	US 2003-466614	20030718
PRIORITY APPLN. INFO.:				
			JP 2001-355253	A 20011120
			JP 2002-8684	A 20020117
			JP 2002-191503	A 20020628
			JP 2002-191504	A 20020628
			JP 2002-221287	A 20020730
			WO 2002-JP12134	W 20021120

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Cathode active mass, the cathode, secondary lithium battery, and manufacture of the active mass and the battery

AB The active mass is a rock-salt type crystalline structured oxide  $\text{Li}_a\text{Mn}_b\text{Ni}_c\text{Co}_d\text{O}_e$  [ $a = 0.85-1.1$ ;  $b, c = 0.2-0.6$ ;  $d = 0.1-0.5$ ;  $e = 1-2$ ; and  $(b+c+d) = 1$ ]; and is manufactured by preparing a 1st solution by dissolving a Mn containing acid salt, a Ni containing acid salt and a Co containing acid salt in  $\text{H}_2\text{O}$  or a  $\text{H}_2\text{O}$  based solvent; preparing a 2nd solution by mixing the 1st solution with a  $\text{NH}_4^+$  containing solution; drying the 2nd solution to obtain a composite salt; and thermal reacting the composite salt with  $\text{LiOH}$  in atmospheric air. The battery has a cathode containing the above active mass, an anode, and an electrolyte solution between the 2 electrodes; and is prepared by charging an uncharged battery to approx.  $\geq 50\%$  of its full charging capacity; and annealing at a temperature  $\geq 60^\circ$ .

ST cathode secondary lithium battery manuf; battery

IT cathode lithium manganese nickel cobalt oxide

IT Battery cathodes  
(compsn. and manufacture of lithium manganese nickel cobalt oxides for secondary lithium battery cathodes)

IT Secondary batteries  
(lithium; manufacture of secondary lithium batteries using annealing treatments and containing lithium manganese nickel cobalt oxide cathodes)

IT 7782-42-5, Graphite, uses  
RL: DEV (Device component use); USES (Uses)  
(anode; manufacture of secondary lithium batteries using annealing treatments and containing lithium manganese nickel cobalt oxide cathodes)

IT 346417-97-8, Cobalt lithium manganese nickel oxide  
( $\text{Co}_0.33\text{LiMn}_0.33\text{Ni}_0.33\text{O}_2$ )  
RL: DEV (Device component use); USES (Uses)  
(compsn. and manufacture of lithium manganese nickel cobalt oxides for secondary lithium battery cathodes)

IT 193215-51-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.15\text{LiMn}_0.3\text{Ni}_0.55\text{O}_2$ )  
532934-37-5, Cobalt lithium manganese nickel oxide  
( $\text{Co}_0.17\text{LiMn}_0.41\text{Ni}_0.42\text{O}_2$ ) 532934-38-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.34\text{LiMn}_0.33\text{Ni}_0.33\text{O}_2$ ) 532934-39-7, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.35\text{LiMn}_0.1\text{Ni}_0.55\text{O}_2$ ) 532934-40-0, Cobalt lithium

manganese nickel oxide (Co<sub>0.16</sub>LiMn<sub>0.42</sub>Ni<sub>0.42</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(compsns. and manufacture of lithium manganese nickel cobalt oxides for secondary lithium battery cathodes:)

IT 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(electrolyte salt; manufacture of secondary lithium batteries

using annealing treatments and containing lithium manganese nickel cobalt oxide cathodes)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6,

Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 1120-71-4,

1,3-Propylene sulfone

RL: DEV (Device component use); USES (Uses)

(electrolyte solvent; manufacture of secondary lithium batteries

using annealing treatments and containing lithium manganese nickel cobalt oxide cathodes)

L3 ANSWER 105 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:418011 CAPLUS

DOCUMENT NUMBER: 139:9293

TITLE: Cathode active mass for secondary lithium battery and the battery

INVENTOR(S): Shiozaki, Ryuji; Fujii, Akihiro; Okabe, Kazuya; Nukuda, Toshiyuki

PATENT ASSIGNEE(S): Yuasa Corporation, Japan

SOURCE: PCT Int. Appl., 57 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003044881	A1	20030530	WO 2002-JP12171	20021121
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2002349424	A1	20030610	AU 2002-349424	20021121
EP 1447866	A1	20040818	EP 2002-783588	20021121
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK			
CN 1723576	A	20060118	CN 2002-819315	20021121
US 2004234857	A1	20041125	US 2004-486080	20040206
PRIORITY APPLN. INFO.:			JP 2001-358017	A 20011122
			WO 2002-JP12171	W 20021121

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Cathode active mass for secondary lithium battery and the battery

AB The title active mass contains a  $\alpha$ -NaFeO<sub>2</sub> structured composite oxide Li<sub>x</sub>Mn<sub>a</sub>Ni<sub>b</sub>Co<sub>c</sub>O<sub>2</sub>, where the set of (a, b, c) is located within a square formed by bonding 4 points A (a, b, c) = (0.5, 0.5, 0), B (0.55, 0.45, 0), C (0.55, 0.15, 0.30), and D (0.15, 0.15, 0.7) in a 3-component constitutional diagram to show  $x/(a + b + c) = 0.95-1.35$ . The battery has a cathode using the above active mass, an anode using a Li-intercalating material, and an electrolyte solution. The battery provides high energy density and good charge-discharge cycle performance.

ST secondary battery cathode lithium manganese nickel cobalt oxide

compn  
 IT Battery cathodes  
     (compns. of lithium manganese nickel cobalt oxides in cathodes for  
     secondary lithium batteries)  
 IT Secondary batteries  
     (lithium; compns. of lithium manganese nickel cobalt oxides in cathodes  
     for secondary lithium batteries)  
 IT 532933-98-5, Cobalt lithium manganese nickel oxide  
     (Co<sub>0.32</sub>Li<sub>1.1</sub>Mn<sub>0.36</sub>Ni<sub>0.32</sub>O<sub>2</sub>) 532933-99-6, Cobalt lithium manganese nickel  
     oxide (Co<sub>0.24</sub>Li<sub>1.3</sub>Mn<sub>0.52</sub>Ni<sub>0.24</sub>O<sub>2</sub>) 532934-00-2, Cobalt lithium  
     manganese nickel oxide (Co<sub>0.05</sub>Li<sub>1.1</sub>Mn<sub>0.52</sub>Ni<sub>0.43</sub>O<sub>2</sub>) 532934-01-3, Cobalt  
     lithium manganese nickel oxide (Co<sub>0.35</sub>Li<sub>1.2</sub>Mn<sub>0.45</sub>Ni<sub>0.20</sub>O<sub>2</sub>) 532934-02-4,  
     Cobalt lithium manganese nickel oxide (Co<sub>0.45</sub>Li<sub>1.1</sub>Mn<sub>0.35</sub>Ni<sub>0.20</sub>O<sub>2</sub>)  
     532934-03-5, Cobalt lithium manganese nickel oxide  
     (Co<sub>0.67</sub>LiMn<sub>0.16</sub>Ni<sub>0.16</sub>O<sub>2</sub>) 532934-04-6, Cobalt lithium manganese nickel  
     oxide (Co<sub>0.25</sub>Li<sub>1.1</sub>Mn<sub>0.5</sub>Ni<sub>0.25</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
     (compns. of lithium manganese nickel cobalt oxides in cathodes for  
     secondary lithium batteries)

L3 ANSWER 106 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:389051 CAPLUS  
 DOCUMENT NUMBER: 139:182783  
 TITLE: The syntheses and characterization of layered  
         LiNi<sub>1-y-z</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub> compounds  
 AUTHOR(S): Ngala, J. Katana; Chernova, Natasha A.; Matienzo,  
              Luis; Zavaliy, Peter Y.; Whittingham, M. Stanley  
 CORPORATE SOURCE: Chemistry Department and the Institute for Materials  
                     Research, State University of New York at Binghamton,  
                     Binghamton, NY, 13902-6016, USA  
 SOURCE: Materials Research Society Symposium Proceedings  
         (2003), 756(Solid State Ionics--2002), 231-236  
         CODEN: MRSPDH; ISSN: 0272-9172  
 PUBLISHER: Materials Research Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS  
                     RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST layered cobalt lithium manganese nickel oxide synthesis; rechargeable  
     battery cathode layered cobalt lithium manganese nickel oxide  
 IT Battery cathodes  
     (syntheses and characterization of layered LiNi<sub>1-y-z</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub> compds.  
     for rechargeable battery cathodes)  
 IT 146956-42-5P, Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.2</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
     193215-50-8P, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>)  
     193215-96-2P, Cobalt lithium manganese nickel oxide  
     (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 217309-43-8P, Cobalt lithium manganese nickel  
     oxide (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 404904-11-6P, Cobalt lithium manganese  
     nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
     preparation); PREP (Preparation); USES (Uses)  
     (syntheses and characterization of layered LiNi<sub>1-y-z</sub>Mn<sub>y</sub>Co<sub>z</sub>O<sub>2</sub> compds.)

L3 ANSWER 107 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:172065 CAPLUS  
 DOCUMENT NUMBER: 138:224159  
 TITLE: Laminar lithium nickel manganese composite oxide for  
         lithium batteries.  
 INVENTOR(S): Shima, Koji; Kikuchi, Kazuhiro  
 PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.  
         CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003068306	A2	20030307	JP 2002-163894	20020605
PRIORITY APPLN. INFO.:			JP 2001-178016	A 20010613
TI	Laminar lithium nickel manganese composite oxide for lithium batteries.			
AB	The disclosed composite oxides have Ni/Mn atomic ratio of 0.7-9.0, and contain less than 300 ppm Mg and Ca. The part of the Ni and Mn may be substituted with Al, Co, or Fe. The composite materials is especially useful as cathodic material for the Li secondary batteries.			
ST	lithium nickel manganese oxide secondary battery cathode			
IT	Battery cathodes (magnesium- and calcium-free lithium manganese nickel oxides for)			
IT	477567-59-2P, Aluminum lithium manganese nickel oxide (Al <sub>0.1</sub> Li <sub>1.05</sub> Mn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 477567-62-7P, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> Li <sub>1.05</sub> Mn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 479258-19-0P, Lithium manganese nickel oxide (Li <sub>1.05</sub> Mn <sub>0.5</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 500912-67-4P, Cobalt lithium manganese nickel oxide (Co <sub>0.33</sub> Li <sub>1.05</sub> Mn <sub>0.33</sub> Ni <sub>0.33</sub> O <sub>2</sub> ) 500912-68-5P, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> Li <sub>1.05</sub> Mn <sub>0.65</sub> Ni <sub>0.15</sub> O <sub>2</sub> ) RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses) (preparation as cathode active materials for lithium secondary batteries)			
IT	7439-95-4, Magnesium, occurrence 7440-70-2, Calcium, occurrence RL: OCU (Occurrence, unclassified); OCCU (Occurrence) (upper limit in Li-Mn-Ni oxide type battery cathode active materials)			

L3 ANSWER 108 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:116796 CAPLUS  
 DOCUMENT NUMBER: 138:156280  
 TITLE: Electrode-active material coated electrode for lithium  
 secondary battery  
 INVENTOR(S): Ishida, Yuko; Okahara, Kenji  
 PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003045414	A2	20030214	JP 2001-227002	20010727
PRIORITY APPLN. INFO.:			JP 2001-227002	20010727
TI	Electrode-active material coated electrode for lithium secondary battery			
AB	The surface of the electrode collector is coated with a layer of electrode active material having d. of 2-2.7 g/cm <sup>3</sup> and containing components A, B, and C, where A is a layer composite oxide of $\geq 2$ of Li and transition metals (Ni, Mn, Co, etc.); B is an elec. conducting agent; and C is a binder. A can be represented by $\text{Li}_w\text{Ni}_x\text{Mn}_y\text{Co}_z\text{O}_2$ , where $0.8 \leq w$ $\leq 1.2$ , $0 \leq w, x, \text{ and } y \leq 2$ , $0 \leq z \leq 0.3$ , $0.8$ $\leq w + x + y + z \leq 1.2$ , Q = Be, B, Mg, Al, Ca, Sc, Ti, V, Cr, Fe, Cu, Zn, or Ga. Preferably, $0.7 \leq w/x \leq 9$ ; and the electrode active material comprises A 10-99, B 0.01-50, and C 0.1-80 weight%. The battery comprises pos. electrode, neg. electrode, and electrolyte.			
ST	electrode active material coating lithium secondary battery; lithium nickel manganese cobalt oxide electrode active material; acetylene black polyvinylidene fluoride electrode active material; ethylene carbonate diethyl carbonate electrolyte battery; lithium hexafluorophosphate electrolyte battery			
IT	Fluoropolymers, uses			

RL: NUU (Other use, unclassified); USES (Uses)  
 (binder; for manufacture of electrode-active material coated electrode for lithium secondary battery)

IT Carbon black, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (elec. conducting agent, electrode-active material containing; for manufacture of electrode-active material coated electrode for lithium secondary battery)

IT Coating materials  
 Collecting apparatus  
 Electrodes  
 (electrode-active material coated electrode for lithium secondary battery)

IT Secondary batteries  
 (lithium; electrode-active material coated electrode for lithium secondary battery)

IT 872-50-4, N-Methylpyrrolidone, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (additive; for manufacture of electrode-active material coated electrode for lithium secondary battery)

IT 24937-79-9, Polyvinylidene fluoride  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (binder; for manufacture of electrode-active material coated electrode for lithium secondary battery)

IT 405890-05-3P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 496861-40-6P  
 RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (electrode-active material containing; electrode-active material coated electrode for lithium secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte containing; for manufacture of lithium secondary battery)

IT 1310-66-3, Lithium hydroxide (LiOH) monohydrate 1317-34-6, Manganese oxide (Mn<sub>2</sub>O<sub>3</sub>) 12054-48-7, Nickel hydroxide (Ni(OH)<sub>2</sub>) 21041-93-0, Cobalt hydroxide (Co(OH)<sub>2</sub>)  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
 (starting material; for manufacture of electrode-active material coated electrode for lithium secondary battery)

L3 ANSWER 109 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2003:97138 CAPLUS  
 DOCUMENT NUMBER: 138:156266  
 TITLE: Production of lithium nickel manganese compound oxides for secondary lithium battery cathodes by firing their raw material mixtures  
 INVENTOR(S): Kikuchi, Kazuhiro; Tsurita, Yasushi  
 PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003034538	A2	20030207	JP 2002-138827	20020514
PRIORITY APPLN. INFO.:			JP 2001-147662	A 20010517
			JP 2001-147663	A 20010517
			JP 2001-147664	A 20010517

TI Production of lithium nickel manganese compound oxides for secondary lithium battery cathodes by firing their raw material mixtures



ST lithium nickel manganese oxide manuf battery cathode; slurry  
spraying firing manuf lithium nickel manganese oxide

IT Transition metal halides  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PROC (Process)  
(manganese halides, slurry component; in production of lithium nickel  
manganese compound oxides for secondary lithium battery  
cathodes by firing of raw material mixts. containing powder obtained by  
spray atomization of slurries)

IT Transition metal halides  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PROC (Process)  
(nickel halides, slurry component; in production of lithium nickel  
manganese compound oxides for secondary lithium battery  
cathodes by firing of raw material mixts. containing powder obtained by  
spray atomization of slurries)

IT Firing (heat treating)  
(production of lithium nickel manganese compound oxides for secondary lithium  
battery cathodes by firing of raw material mixts. containing powder  
obtained by spray atomization of slurries)

IT Battery cathodes  
(secondary lithium battery; production of lithium nickel  
manganese compound oxides for secondary lithium battery  
cathodes by firing of raw material mixts. containing powder obtained by  
spray atomization of slurries)

IT 162684-16-4P, Lithium manganese nickel oxide  
RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(battery cathodes; production of lithium nickel manganese compound  
oxides for secondary lithium battery cathodes by firing of  
raw material mixts. containing powder obtained by spray atomization of  
slurries)

IT 495464-12-5P  
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP  
(Preparation); USES (Uses)  
(battery cathodes; production of lithium nickel manganese compound  
oxides for secondary lithium battery cathodes by firing of  
raw material mixts. containing powder obtained by spray atomization of  
slurries)

IT 546-89-4, Lithium acetate 554-13-2, Lithium carbonate 598-62-9,  
Manganese carbonate 1310-65-2, Lithium hydroxide 1313-13-9, Manganese  
oxide (mno2), processes 1313-99-1, Nickel oxide (nio), processes  
1317-34-6, Manganese oxide (mn2o3) 1317-35-7, Manganese oxide (mn3o4)  
3333-67-3, Nickel carbonate (nico3) 7785-87-7, Manganese sulfate  
7786-81-4, Nickel sulfate 7790-69-4, Lithium nitrate 10377-66-9,  
Manganese nitrate [Mn(NO3)2] 12054-48-7, Nickel hydroxide 12626-88-9,  
Manganese hydroxide 12710-12-2, Manganese oxyhydroxide 13138-45-9,  
Nickel nitrate 55070-72-9, Nickel oxide hydroxide  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PROC (Process)  
(slurry component; in production of lithium nickel manganese compound oxides  
for secondary lithium battery cathodes by firing of raw  
material mixts. containing powder obtained by spray atomization of  
slurries)

L3 ANSWER 110 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:93990 CAPLUS

DOCUMENT NUMBER: 138:156241

TITLE: Production of layered lithium nickel manganese  
compound oxide powder with high bulk density for  
secondary lithium battery cathodes

INVENTOR(S): Kikuchi, Kazuhiro; Shima, Koji

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	JP 2003034537	A2	20030207	JP 2001-218996	20010719
PRIORITY APPLN. INFO.:				JP 2001-218996	20010719
TI	Production of layered lithium nickel manganese compound oxide powder with high bulk density for secondary lithium battery cathodes				
ST	lithium nickel manganese oxide powder battery cathode;				
	compressive shear stress lithium nickel manganese oxide powder				
IT	Shear stress				
	(compressive; production of layered lithium nickel manganese compound oxide powder with high bulk d. for secondary lithium battery cathodes by applying compressive shear stress)				
IT	Battery cathodes				
	(secondary lithium battery; production of layered lithium nickel manganese compound oxide powder with high bulk d. for secondary lithium battery cathodes by applying compressive shear stress)				
IT	Compression				
	(shear stress; production of layered lithium nickel manganese compound oxide powder with high bulk d. for secondary lithium battery cathodes by applying compressive shear stress)				
IT	162684-16-4P, Lithium manganese nickel oxide 495464-12-5P				
	RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)				
	(powder, battery cathodes; production of layered lithium nickel manganese compound oxide powder with high bulk d. for secondary lithium battery cathodes by applying compressive shear stress)				

L3 ANSWER 111 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:75510 CAPLUS  
DOCUMENT NUMBER: 138:140052  
TITLE: Secondary nonaqueous battery  
INVENTOR(S): Kuriyama, Kazuya; Okano, Yukiko; Yata, Shizukuni  
PATENT ASSIGNEE(S): Kansai Research Institute Inc., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	JP 2003031262	A2	20030131	JP 2001-209038	20010710
PRIORITY APPLN. INFO.:				JP 2001-209038	20010710
TI	Secondary nonaqueous battery				
AB	The battery has a cathode containing Li <sub>a</sub> Mn <sub>b</sub> Ni <sub>c</sub> MdO <sub>2</sub> [M = Co, Al and/or Fe; a = 1-1.1; 0.3 ≤ b < 0.5; 0.3 ≤ c < 0.5; 0 < d ≤ 0.3; and (b+c+d) = 1] as active mass; an anode using an active mass, containing a mixture of graphitized mesocarbon microbeads and graphite particles coated with an amorphous C layer; a separator; and a nonaq. electrolyte solution containing a Li salt; where the graphite has interplanar spacing in (002) plane (d <sub>002</sub> ) < 0.34 nm and the amorphous C has interplanar spacing ≥ 0.34 nm in x-ray wide-angle diffraction pattern; and the electrolyte preferably contains a disulfide derivative				
ST	secondary battery cathode lithium manganese nickel composite oxide compn; carbonaceous anode amorphous carbon coated graphite graphitized mesocarbon mixt				
IT	Secondary batteries				
	(structure of secondary lithium batteries containing Li Mn Ni oxide cathodes and carbonaceous anodes)				
IT	7440-44-0, MCMB 25-28, uses 462114-58-5, OPGC-K				
	RL: DEV (Device component use); USES (Uses)				

(anodes containing graphitized mesocarbon microbeads and amorphous C coated graphite particles with controlled d002 for secondary lithium batteries)

IT 193215-96-2, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 193215-97-3, Cobalt lithium manganese nickel oxide  
(Co<sub>0.25</sub>LiMn<sub>0.4</sub>Ni<sub>0.35</sub>O<sub>2</sub>) 493394-61-9, Cobalt lithium manganese nickel  
oxide (Co<sub>0.3</sub>LiMn<sub>0.35</sub>Ni<sub>0.35</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(compsn. of cathode active mass for secondary lithium batteries  
)  
IT 5335-87-5, Bis(4-methoxy phenyl)disulfide  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solns. containing disulfide derivs. for secondary lithium  
batteries)

L3 ANSWER 112 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:75480 CAPLUS  
DOCUMENT NUMBER: 138:140039  
TITLE: Cathode active mass and secondary nonaqueous  
electrolyte battery thereof  
INVENTOR(S): Okabe, Kazuya; Shiosaki, Ryuji; Yufu, Hiroshi  
PATENT ASSIGNEE(S): Yuasa Corporation, Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003031219	A2	20030131	JP 2001-213298	20010713
PRIORITY APPLN. INFO.:			JP 2001-213298	20010713

TI Cathode active mass and secondary nonaqueous electrolyte battery  
thereof

ST secondary battery cathode lithium composite oxide compn

IT Battery cathodes  
(compsn. of cathode active mass containing Li composite oxides for  
secondary lithium batteries)

IT 193215-92-8, Cobalt lithium manganese nickel oxide  
(Co<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 193215-96-2, Cobalt lithium manganese  
nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 317831-74-6, Cobalt lithium  
manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.5</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 404904-11-6, Cobalt lithium  
manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 405890-05-3, Cobalt  
lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405890-05-3  
, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>)  
459408-91-4 459408-93-6 459408-94-7  
459408-95-8 459408-97-0 493326-93-5, Cobalt lithium  
manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.34</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(compsn. of cathode active mass containing Li composite oxides for  
secondary lithium batteries)

L3 ANSWER 113 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2003:56649 CAPLUS  
DOCUMENT NUMBER: 138:124974  
TITLE: Secondary nonaqueous battery equipped with  
lithium manganese nickel mixed oxide cathode and  
aromatic hydrocarbon anode and its manufacture  
INVENTOR(S): Kuriyama, Kazuya; Okano, Yukiko; Yata, Shizukuni  
PATENT ASSIGNEE(S): Kansai Research Institute Inc., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003022804	A2	20030124	JP 2001-206832	20010706
PRIORITY APPLN. INFO.:			JP 2001-206832	20010706
TI	Secondary nonaqueous battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode and its manufacture			
AB	The title battery is equipped with a cathode containing $\text{Li}a\text{MnbNicMdO}_2$ ( $M = \text{Co, Al, and/or Fe}$ ; $a = 1-1.1$ ; $0.3 \leq b < 0.5$ ; $0.3 \leq c < 0.5$ ; $0 < d \leq 0.3$ ; $b + c + d = 1$ ) and an anode containing a polycyclic aromatic hydrocarbon obtained by thermal reaction of a pitch-based raw material and satisfying H/C atomic ratio 0.35-0.05 and BET sp. surface area $\leq 50 \text{ m}^2/\text{g}$ . The claimed process is characterized by initial charging at 40-80°. The battery provides high capacity and long cycle life.			
ST	lithium manganese nickel oxide cathode secondary battery; polycyclic arom hydrocarbon anode lithium battery			
IT	Polycyclic compounds RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (aromatic hydrocarbons; manufacture of secondary nonaq. battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode)			
IT	Secondary batteries (lithium; manufacture of secondary nonaq. battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode)			
IT	Battery anodes Battery cathodes (manufacture of secondary nonaq. battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode)			
IT	Aromatic hydrocarbons, uses RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses) (polycyclic; manufacture of secondary nonaq. battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode)			
IT	Coal tar pitch (thermal decomposition of; manufacture of secondary nonaq. battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode)			
IT	193215-96-2, Cobalt lithium manganese nickel oxide ( $\text{Co}_0.2\text{LiMn}_0.4\text{Ni}_0.4\text{O}_2$ ) RL: DEV (Device component use); USES (Uses) (manufacture of secondary nonaq. battery equipped with lithium manganese nickel mixed oxide cathode and aromatic hydrocarbon anode)			

L3 ANSWER 114 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2002:900566 CAPLUS  
DOCUMENT NUMBER: 138:15237  
TITLE: Layer structured lithium nickel manganese oxide, battery cathode, and secondary lithium battery  
INVENTOR(S): Kikuchi, Kazuhiro  
PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002338250 A2 20021127 JP 2001-147665 20010517  
 PRIORITY APPLN. INFO.: JP 2001-147665 20010517  
 TI Layer structured lithium nickel manganese oxide, battery  
 cathode, and secondary lithium battery  
 AB The oxide has a Ni/Mn mol ratio 0.7-9 and has part of Ni and Mn replaced  
 by other elements M, and when M = Al the Ni/Mn mol ratio is 0.8-1.2. The  
 oxide is preferably  $\text{Li}_x\text{Ni}_y\text{Mn}_z\text{M}_1-y-z\text{O}_2$ , where M = al, Co, Fe, Mg, and/or  
 Ca;  $0 < x \leq 1.2$ ,  $0.7 \leq (y/z) \leq 9$  [ $0.8 \leq (y/z)$   
 $\leq 1.2$  when M = Al], and  $0 < (1-y-z) \leq 0.5$ . A secondary Li  
 battery uses the oxide for cathode.  
 ST secondary battery cathode lithium manganese nickel oxide; layer  
 structured lithium manganese nickel oxide cathode  
 IT Battery cathodes  
 (compns. of layer structured substituted lithium manganese nickel  
 oxides for cathodes in secondary lithium batteries)  
 IT 477567-59-2, Aluminum lithium manganese nickel oxide  
 ( $\text{Al}_{0.1}\text{Li}_{1.05}\text{Mn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 477567-62-7, Cobalt lithium  
 manganese nickel oxide ( $\text{Co}_{0.1}\text{Li}_{1.05}\text{Mn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ )  
 RL: DEV (Device component use); USES (Uses)  
 (compns. of layer structured substituted lithium manganese nickel  
 oxides for cathodes in secondary lithium batteries)

L3 ANSWER 115 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2002:833142 CAPLUS  
 DOCUMENT NUMBER: 137:339998  
 TITLE: Cathode active mass, its manufacture, the cathode, and  
 secondary nonaqueous battery  
 INVENTOR(S): Shiozaki, Ryuji; Okabe, Kazuya; Nukuda, Toshiyuki;  
 Fujii, Akihiro; Inamasu, Tokuo; Iguchi, Takaaki;  
 Kojima, Toshiaki; Watari, Takashi; Yufu, Hiroshi  
 PATENT ASSIGNEE(S): Yuasa Corporation, Japan  
 SOURCE: PCT Int. Appl., 175 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002086993	A1	20021031	WO 2002-JP3862	20020418
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,				
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,				
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,				
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,				
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,				
UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,				
TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,				
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,				
BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1391950	A1	20040225	EP 2002-722703	20020418
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
TW 541745	B	20030711	TW 2002-91108148	20020419
PRIORITY APPLN. INFO.:			JP 2001-121901	A 20010420
			JP 2001-124842	A 20010423
			JP 2001-237084	A 20010803
			JP 2001-249578	A 20010820
			JP 2001-288831	A 20010921
			JP 2001-307173	A 20011003
			JP 2001-354436	A 20011120
			WO 2002-JP3862	W 20020418
REFERENCE COUNT: 13			THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS	
			RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT	
TI Cathode active mass, its manufacture, the cathode, and secondary				

nonaqueous battery

AB The cathode active mass is  $\text{Li}_a\text{Mn}_{0.5-x}\text{Ni}_{0.5-y}\text{M}_x\text{yO}_2$ , where  $0 < a \leq 1.3$ ,  $(-0.1) \leq (x-y) \leq 0.1$ , and M = elements other than Li, Mn, and Ni. Preferably, the active mass has pore volume 0.001-0.006 mL/g or sp. surface area 0.3-1.6 m<sup>2</sup>/g and has  $I_{44}/I_{18} = 0.65-1.05$ , where  $I_{18}$  and  $I_{44}$  are the intensities of peaks at  $2\theta = 18.6 \pm 1$  and  $44.1 \pm 1^\circ$  on its powder x ray diffraction pattern. The manufacture of the active mass includes steps of continuously supplying sep. aqueous solns. of Mn, Ni, and M salts, a complexing agent, and a reducing agent or a mixture of  $\geq 2$  of the above components to a reaction tank; and continuously supplying an aqueous alkali solution to the tank to form a coppt. of Ni, Mn, and M. The battery has a cathode using the active mass.

ST secondary battery cathode lithium nickel manganese oxide manuf; diffraction pattern lithium nickel manganese oxide battery cathode; porosity lithium nickel manganese oxide battery cathode; surface area lithium nickel manganese oxide battery cathode

IT Battery cathodes  
(compns. and properties and manufacture of substituted lithium manganese nickel oxides for secondary lithium battery cathodes)

IT 193215-00-8P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.2}\text{Ni}_{0.7}\text{O}_2$ )  
346417-97-8P, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 405890-05-3P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 474265-95-7P, Lithium manganese nickel oxide ( $\text{Li}_{1.02}\text{Mn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 474265-96-8P, Lithium manganese nickel oxide ( $\text{Li}_{1.02}\text{Mn}_{0.6}\text{Ni}_{0.4}\text{O}_2$ ) 474265-97-9P, Lithium manganese nickel oxide ( $\text{Li}_{1.02}\text{Mn}_{0.4}\text{Ni}_{0.6}\text{O}_2$ ) 474265-98-0P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.02}\text{Mn}_{0.42}\text{Ni}_{0.42}\text{O}_2$ ) 474266-00-7P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.25}\text{Li}_{1.02}\text{Mn}_{0.38}\text{Ni}_{0.38}\text{O}_2$ ) 474266-01-8P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{1.02}\text{Mn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ) 474266-02-9P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.08}\text{Li}_{1.02}\text{Mn}_{0.48}\text{Ni}_{0.48}\text{O}_2$ ) 474266-03-0P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{Li}_{1.02}\text{Mn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 474266-04-1P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{Li}_{1.02}\text{Mn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ ) 474266-05-2P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{Li}_{1.02}\text{Mn}_{0.4}\text{Ni}_{0.5}\text{O}_2$ ) 474266-06-3P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{Li}_{1.01}\text{Mn}_{0.25}\text{Ni}_{0.35}\text{O}_2$ ) 474266-07-4P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.06}\text{Li}_{0.99}\text{Mn}_{0.5}\text{Ni}_{0.44}\text{O}_2$ ) 474266-08-5P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.6}\text{Li}_{1.01}\text{Mn}_{0.2}\text{Ni}_{0.2}\text{O}_2$ ) 474266-09-6P, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.01}\text{Mn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 474266-10-9P, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.01}\text{Mn}_{0.59}\text{Ni}_{0.4}\text{O}_2$ ) 474266-11-0P, Lithium magnesium manganese nickel oxide ( $\text{LiMg}_{0.01}\text{Mn}_{0.4}\text{Ni}_{0.59}\text{O}_2$ ) 474266-12-1P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.01}\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ ) 474266-13-2P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.01}\text{LiMn}_{0.59}\text{Ni}_{0.4}\text{O}_2$ ) 474266-14-3P, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.01}\text{LiMn}_{0.4}\text{Ni}_{0.59}\text{O}_2$ )  
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); PREP (Preparation); USES (Uses)  
(compns. and properties and manufacture of substituted lithium manganese nickel oxides for secondary lithium battery cathodes)

L3 ANSWER 116 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:784062 CAPLUS

DOCUMENT NUMBER: 138:273957

TITLE: Layered  $\text{Li}(\text{Ni}_{0.5-x}\text{Mn}_{0.5-x}\text{M}'_2\text{x})\text{O}_2$  ( $\text{M}' = \text{Co, Al, Ti}$ ;  $x = 0, 0.025$ ) cathode materials for Li-ion rechargeable batteries

AUTHOR(S): Kang, S.-H.; Kim, J.; Stoll, M. E.; Abraham, D.; Sun, Y. K.; Amine, K.

CORPORATE SOURCE: Chemical Technology Division, Electrochemical Technology Program, Argonne National Laboratory, Argonne, IL, 60439, USA

SOURCE: Journal of Power Sources (2002), 112(1), 41-48  
CODEN: JPSODZ; ISSN: 0378-7753

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English  
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Layered Li(Ni<sub>0.5</sub>-xMn<sub>0.5</sub>-xM'<sub>2</sub>x)O<sub>2</sub> (M' = Co, Al, Ti; x = 0, 0.025) cathode materials for Li-ion rechargeable batteries

ST lithium manganese nickel oxide layered cathode battery; aluminum lithium manganese nickel oxide layered cathode battery; cobalt lithium manganese nickel oxide layered cathode battery; titanium lithium manganese nickel oxide layered cathode battery

IT Battery cathodes  
Secondary batteries  
(layered lithium manganese nickel oxide-based cathode materials for lithium-ion batteries)

IT 459408-74-3, Aluminum lithium manganese nickel oxide (Al<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 459408-78-7, Lithium manganese nickel titanium oxide (LiMn<sub>0.48</sub>Ni<sub>0.48</sub>Ti<sub>0.05</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(layered aluminum lithium manganese nickel oxide cathode materials for lithium-ion batteries)

IT 459408-76-5, Cobalt lithium manganese nickel oxide (Co<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(layered cobalt lithium manganese nickel oxide cathode materials for lithium-ion batteries)

IT 128975-24-6, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
RL: DEV (Device component use); USES (Uses)  
(layered lithium manganese nickel oxide cathode materials for lithium-ion batteries)

L3 ANSWER 117 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2002:719559 CAPLUS  
DOCUMENT NUMBER: 138:58832  
TITLE: Structure and Electrochemistry of Li[NixCol-2xMnx]O<sub>2</sub> (0 ≤ x ≤ 1/2)  
AUTHOR(S): MacNeil, D. D.; Lu, Z.; Dahn, J. R.  
CORPORATE SOURCE: Dep. Chem., Dalhousie Univ., Halifax, NS, B3H3J5, Can.  
SOURCE: Journal of the Electrochemical Society (2002), 149(10), A1332-A1336  
CODEN: JESOAN; ISSN: 0013-4651  
PUBLISHER: Electrochemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ST battery cobalt lithium manganese nickel oxide cathode structure electrochem

IT Secondary batteries  
(lithium; structure and electrochem. of Li[NixCol-2xMnx]O<sub>2</sub> cathode for batteries)

IT Battery cathodes  
(structure and electrochem. of Li[NixCol-2xMnx]O<sub>2</sub> cathode for batteries)

IT 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 128975-24-6, Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 214473-76-4, Cobalt lithium manganese nickel oxide (Co<sub>0.9</sub>LiMn<sub>0.05</sub>Ni<sub>0.05</sub>O<sub>2</sub>) 404904-11-6, Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.3</sub>Ni<sub>0.3</sub>O<sub>2</sub>) 405890-05-3, Cobalt lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 468772-63-6, Cobalt lithium manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.38</sub>Ni<sub>0.38</sub>O<sub>2</sub>) 479624-33-4, Cobalt lithium manganese nickel oxide (Co<sub>0.98</sub>LiMn<sub>0.01</sub>Ni<sub>0.01</sub>O<sub>2</sub>) 479624-34-5, Cobalt lithium manganese nickel oxide (Co<sub>0.95</sub>LiMn<sub>0.02</sub>Ni<sub>0.02</sub>O<sub>2</sub>) 479624-35-6, Cobalt lithium manganese nickel oxide (Co<sub>0.85</sub>LiMn<sub>0.08</sub>Ni<sub>0.08</sub>O<sub>2</sub>) 479624-36-7, Cobalt lithium manganese nickel oxide (Co<sub>0.7</sub>LiMn<sub>0.15</sub>Ni<sub>0.15</sub>O<sub>2</sub>) 479624-38-9, Cobalt lithium manganese nickel oxide (Co<sub>0.55</sub>LiMn<sub>0.22</sub>Ni<sub>0.22</sub>O<sub>2</sub>)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(structure and electrochem. of Li[NixCol-2xMnx]O<sub>2</sub> cathode for

batteries)

L3 ANSWER 118 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2002:716671 CAPLUS  
DOCUMENT NUMBER: 137:235265  
TITLE: Cathode active mass and secondary nonaqueous  
electrolyte battery thereof  
INVENTOR(S): Okabe, Kazuya; Shiozaki, Ryuji; Fujii, Akihiro; Ito,  
Akinori; Yufu, Hiroshi  
PATENT ASSIGNEE(S): Yuasa Corporation, Japan  
SOURCE: PCT Int. Appl., 87 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE			
WO 2002073718	A1	20020919	WO 2002-JP2284	20020312			
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM						
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG						
EP 1372202	A1	20031217	EP 2002-703970	20020312			
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR						
TW 560098	B	20031101	TW 2002-91104740	20020313			
PRIORITY APPLN. INFO.:			JP 2001-71486	A 20010314			
			JP 2001-80430	A 20010321			
			JP 2001-80434	A 20010321			
			WO 2002-JP2284	W 20020312			
REFERENCE COUNT:	7	THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT					
TI	Cathode active mass and secondary nonaqueous electrolyte battery thereof						
AB	The Li Mn Ni oxide based cathode active mass has a BET surface 0.3-1.5 m <sup>2</sup> /g. Preferably, the oxide is LiMn <sub>0.5</sub> Ni <sub>0.5</sub> O <sub>2</sub> , where part of Mn and Ni may be replaced by Li, B, Mg, Al, Ti, V, Cr, Fe, Co, Cu, and/or Zn; and has a layered structure with specified peaks on its CuK $\alpha$ powder x ray diffraction pattern. The battery is a secondary Li battery.						
ST	secondary battery cathode lithium manganese nickel oxide compn; BET surface cathode lithium manganese nickel oxide compn						
IT	Battery cathodes (comps. and BET surface and x ray diffraction patterns of lithium manganese nickel oxide based cathode active mass for secondary lithium batteries)						
IT	128975-24-6, Lithium manganese nickel oxide (LiMn <sub>0.5</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 193215-96-2, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.4</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) 405890-05-3, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 459408-72-1, Lithium manganese nickel borate oxide (LiMn <sub>0.48</sub> Ni <sub>0.48</sub> (BO <sub>3</sub> ) <sub>0.05</sub> O <sub>1.85</sub> ) 459408-73-2, Lithium manganese nickel vanadium oxide (LiMn <sub>0.48</sub> Ni <sub>0.48</sub> V <sub>0.05</sub> O <sub>2</sub> ) 459408-74-3, Aluminum lithium manganese nickel oxide (Al <sub>0.05</sub> LiMn <sub>0.48</sub> Ni <sub>0.48</sub> O <sub>2</sub> ) 459408-75-4, Lithium magnesium manganese nickel oxide (LiMg <sub>0.05</sub> Mn <sub>0.48</sub> Ni <sub>0.48</sub> O <sub>2</sub> ) 459408-76-5, Cobalt lithium manganese nickel oxide (Co <sub>0.05</sub> LiMn <sub>0.48</sub> Ni <sub>0.48</sub> O <sub>2</sub> ) 459408-77-6, Chromium lithium manganese nickel oxide (Cr <sub>0.05</sub> LiMn <sub>0.48</sub> Ni <sub>0.48</sub> O <sub>2</sub> ) 459408-78-7, Lithium manganese nickel titanium oxide (LiMn <sub>0.48</sub> Ni <sub>0.48</sub> Ti <sub>0.05</sub> O <sub>2</sub> ) 459408-79-8,						



Iron lithium manganese nickel oxide (Fe<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>)  
 459408-80-1, Copper lithium manganese nickel oxide  
 (Cu<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.48</sub>O<sub>2</sub>) 459408-81-2, Lithium manganese nickel  
 oxide (LiMn<sub>0.48</sub>Ni<sub>0.48</sub>Zn<sub>0.05</sub>O<sub>2</sub>) 459408-82-3, Lithium manganese nickel  
 vanadium oxide (LiMn<sub>0.48</sub>Ni<sub>0.47</sub>V<sub>0.05</sub>O<sub>2</sub>) 459408-83-4, Aluminum lithium  
 manganese nickel oxide (Al<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.47</sub>O<sub>2</sub>) 459408-84-5, Lithium  
 magnesium manganese nickel oxide (LiMg<sub>0.05</sub>Mn<sub>0.48</sub>Ni<sub>0.47</sub>O<sub>2</sub>)  
 459408-85-6, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.47</sub>O<sub>2</sub>) 459408-86-7, Chromium lithium manganese nickel  
 oxide (Cr<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.47</sub>O<sub>2</sub>) 459408-87-8, Lithium manganese nickel  
 titanium oxide (LiMn<sub>0.48</sub>Ni<sub>0.47</sub>Ti<sub>0.05</sub>O<sub>2</sub>) 459408-88-9, Iron lithium  
 manganese nickel oxide (Fe<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.47</sub>O<sub>2</sub>) 459408-89-0, Copper  
 lithium manganese nickel oxide (Cu<sub>0.05</sub>LiMn<sub>0.48</sub>Ni<sub>0.47</sub>O<sub>2</sub>) 459408-90-3,  
 Lithium manganese nickel zinc oxide (LiMn<sub>0.48</sub>Ni<sub>0.47</sub>Zn<sub>0.05</sub>O<sub>2</sub>)  
 459408-91-4 459408-92-5 459408-93-6  
 459408-94-7 459408-95-8 459408-96-9  
 459408-97-0 459408-98-1 459408-99-2  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (compsn. and BET surface and x ray diffraction patterns of lithium  
 manganese nickel oxide based cathode active mass for secondary lithium  
 batteries)

L3 ANSWER 119 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2002:391648 CAPLUS  
 DOCUMENT NUMBER: 136:388525  
 TITLE: Lithium containing multiple oxide, secondary  
 nonaqueous battery using the oxide, and  
 manufacture of the oxide  
 INVENTOR(S): Ueda, Atsushi; Uchitomi, Kazutaka; Aoyama, Shigeo  
 PATENT ASSIGNEE(S): Hitachi Maxell, Ltd., Japan  
 SOURCE: PCT Int. Appl., 46 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002040404	A1	20020523	WO 2001-JP9967	20011114
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002014289	A5	20020527	AU 2002-14289	20011114
EP 1295851	A1	20030326	EP 2001-982785	20011114
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003238165	A2	20030827	JP 2002-378538	20011114
CN 1741308	A	20060301	CN 2005-10085989	20011114
US 2003082452	A1	20030501	US 2002-181163	20020716
US 2005260496	A1	20051124	US 2005-191742	20050728
PRIORITY APPLN. INFO.:			JP 2000-350307	A 20001116
			JP 2001-282767	A 20010918
			CN 2001-806600	A3 20011114
			JP 2002-542738	A3 20011114
			WO 2001-JP9967	W 20011114
			US 2002-181163	A3 20020716

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT  
 TI Lithium containing multiple oxide, secondary nonaqueous battery

using the oxide, and manufacture of the oxide  
AB The multiple oxide is  $\text{Li}_{1+x+\alpha}\text{Ni}_{(1-x-y+\delta)}/2\text{Mn}_{(1-x-y-\delta)}/2\text{MyO}_2$  [M = Ti, Cr, Fe, Co, Cu, Zn, Al, Ge, and/or Sn;  $x \leq 0.05$ ,  $(-0.05 \leq (x+\alpha) \leq 0.05$ ,  $y \leq 0.4$ ,  $(-0.1) \leq \delta \leq 0.1$  when  $y \leq 0.2$ , and  $(-0.24) \leq \delta \leq 0.24$  when  $0.2 < y \leq 0.4$ ]. The oxide is prepared by sintering a mixture of a Li compound and a compound containing Mn and Ni. The secondary battery is a Li battery using the oxide for cathode.

ST secondary battery cathode lithium manganese nickel oxide manuf

IT Battery cathodes

(comps. and manufacture of (substituted) lithium manganese nickel oxides for cathodes for secondary lithium batteries)

IT 12190-79-3, Cobalt lithium oxide ( $\text{LiCoO}_2$ )

RL: DEV (Device component use); USES (Uses)

((substituted) lithium manganese nickel oxide cathodes containing lithium cobaltate for secondary lithium batteries)

IT 427884-41-1P, Lithium manganese nickel oxide ( $\text{Li}_{0.99}\text{Mn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ )

427884-42-2P, Lithium manganese nickel oxide ( $\text{Li}_{1.01}\text{Mn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ )

427884-43-3P, Lithium manganese nickel oxide ( $\text{Li}_{1.02}\text{Mn}_{0.49}\text{Ni}_{0.49}\text{O}_2$ )

427884-44-4P, Lithium manganese nickel oxide ( $\text{Li}_{1.03}\text{Mn}_{0.48}\text{Ni}_{0.48}\text{O}_2$ )

427884-45-5P, Lithium manganese nickel oxide ( $\text{Li}_{1.04}\text{Mn}_{0.48}\text{Ni}_{0.48}\text{O}_2$ )

427884-46-6P, Lithium manganese nickel oxide ( $\text{Li}_{1.05}\text{Mn}_{0.48}\text{Ni}_{0.48}\text{O}_2$ )

427884-47-7P, Cobalt lithium manganese nickel oxide

( $\text{Co}_{0.1}\text{Li}_{0.99}\text{Mn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 427884-48-8P, Cobalt lithium manganese

nickel oxide ( $\text{Co}_{0.25}\text{Li}_{0.99}\text{Mn}_{0.38}\text{Ni}_{0.38}\text{O}_2$ ) 427884-49-9P, Cobalt lithium

manganese nickel oxide ( $\text{Co}_{0.33}\text{Li}_{0.99}\text{Mn}_{0.33}\text{Ni}_{0.34}\text{O}_2$ ) 427884-50-2P, Cobalt

lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{Li}_{0.99}\text{Mn}_{0.3}\text{Ni}_{0.3}\text{O}_2$ )

RL: DEV (Device component use); IMF (Industrial manufacture); PREP

(Preparation); USES (Uses)

(comps. and manufacture of (substituted) lithium manganese nickel oxides for cathodes for secondary lithium batteries)

L3 ANSWER 120 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:378515 CAPLUS

DOCUMENT NUMBER: 136:372252

TITLE: Lithium containing transition metal oxide and its manufacture

INVENTOR(S): Suhara, Manabu; Sunahara, Kazuo; Kimura, Takashi; Mihara, Takuya; Yukawa, Megumi

PATENT ASSIGNEE(S): Seimi Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002145623	A2	20020522	JP 2000-337008	20001106
PRIORITY APPLN. INFO.:			JP 2000-337008	20001106

AB The oxide is  $\text{LiNi}_x\text{Mn}_{1-x-y}\text{MyO}_2$  ( $0.30 \leq x \leq 0.65$ ,  $y \leq 0.2$ , M = Fe, Co, Cr, Al, Ti, Ga, In, and/or Sn) with an average valence of Ni, Mn, and M being 2.700-2.970. The oxide is prepared by mixing a Li compound with a copptd. Ni-Mn-M compound and sintering at 500-1000° in an inert atmospheric The oxide is useful for secondary battery cathodes.

ST secondary battery cathode lithium manganese nickel oxide compn manuf

IT Battery cathodes

(comps. and manufacture of lithium transition metal oxides with controlled average transition metal valence for secondary lithium battery cathodes)

IT 128975-24-6P, Lithium manganese nickel oxide ( $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ )

162684-16-4DP, Lithium manganese nickel oxide, substituted

405890-05-3P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405890-06-4P, Chromium lithium manganese nickel  
 oxide (Cr<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405890-07-5P, Iron lithium manganese  
 nickel oxide (Fe<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405890-08-6P, Aluminum lithium  
 manganese nickel oxide (Al<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 422520-44-3P, Lithium  
 manganese nickel titanium oxide (LiMn<sub>0.45</sub>Ni<sub>0.45</sub>Ti<sub>0.1</sub>O<sub>2</sub>) 422520-45-4P,  
 Gallium lithium manganese nickel oxide (Ga<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>)  
 422520-46-5P, Indium lithium manganese nickel oxide  
 (In<sub>0.1</sub>LiMn<sub>0.45</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 422520-48-7P, Lithium manganese nickel tin oxide  
 (LiMn<sub>0.45</sub>Ni<sub>0.45</sub>Sn<sub>0.1</sub>O<sub>2</sub>)

RL: DEV (Device component use); IMF (Industrial manufacture); PRP  
 (Properties); PREP (Preparation); USES (Uses)

(comps. and manufacture of lithium transition metal oxides with controlled  
 average transition metal valence for secondary lithium battery  
 cathodes)

L3 ANSWER 121 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:253367 CAPLUS

DOCUMENT NUMBER: 136:281942

TITLE: Secondary lithium battery

INVENTOR(S): Suhara, Manabu; Sunahara, Kazuo; Kimura, Takashi;  
 Mihara, Takuya

PATENT ASSIGNEE(S): Seimi Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2002100358	A2	20020405	JP 2000-289767	20000925
PRIORITY APPLN. INFO.:				JP 2000-289767	20000925
TI	Secondary lithium battery				
AB	The battery uses a cathode active mass mixture containing $\text{Li}_x\text{Ni}_y\text{Mn}_{1-y-z}\text{M}_z\text{O}_2$ ( $\text{M} = \text{Fe}, \text{Co}, \text{Cr}, \text{and/or Al}$ ; $0.9 \leq x \leq 1.2$ ; $0.40 \leq y \leq 0.60$ ; $z \leq 0.2$ ) and $\text{Li}_x\text{P}_y\text{Mn}_{2-4}\text{O}_4$ ( $1 \leq p \leq 1.3$ ) having $\text{Fd}_{3m}$ spinel type structure.				
ST	secondary battery cathode lithium transition metal oxide mixt; nickel manganese lithium oxide cathode mixt battery				
IT	Battery cathodes (cathodes containing (substituted) lithium manganese nickel oxide and spinel type lithium manganese oxide for secondary lithium batteries)				
IT	128975-24-6, Lithium manganese nickel oxide (Li <sub>2</sub> MnNiO <sub>4</sub> ) 179186-44-8, Lithium manganese nickel oxide (LiMn <sub>0.4</sub> Ni <sub>0.6</sub> O <sub>2</sub> ) 287718-96-1, Lithium manganese nickel oxide (LiMn <sub>0.45</sub> Ni <sub>0.55</sub> O <sub>2</sub> ) 405890-05-3, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 405890-06-4, Chromium lithium manganese nickel oxide (Cr <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 405890-07-5, Iron lithium manganese nickel oxide (Fe <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) 405890-08-6, Aluminum lithium manganese nickel oxide (Al <sub>0.1</sub> LiMn <sub>0.45</sub> Ni <sub>0.45</sub> O <sub>2</sub> ) RL: DEV (Device component use); USES (Uses) (cathodes containing (substituted) lithium manganese nickel oxide and spinel type lithium manganese oxide for secondary lithium batteries)				
IT	130242-31-8, Lithium manganese oxide (Li <sub>1.05</sub> Mn <sub>2</sub> O <sub>4</sub> ) RL: DEV (Device component use); PRP (Properties); USES (Uses) (cathodes containing (substituted) lithium manganese nickel oxide and spinel type lithium manganese oxide for secondary lithium batteries)				

L3 ANSWER 122 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:253366 CAPLUS

DOCUMENT NUMBER: 136:281941

TITLE: Secondary lithium battery  
 INVENTOR(S): Suhara, Manabu; Sunahara, Kazuo; Kimura, Takashi;  
 Mihara, Takuya  
 PATENT ASSIGNEE(S): Seimi Chemical Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2002100357	A2	20020405	JP 2000-289763	20000925
PRIORITY APPLN. INFO.:				JP 2000-289763	20000925
TI	Secondary lithium battery				
AB	The battery uses a cathode active mass mixture containing $\text{Li}_x\text{Ni}_y\text{Mn}_{1-y-z}\text{M}_z\text{O}_2$ ( $\text{M} = \text{Fe}, \text{Co}, \text{Cr}, \text{and/or Al}; 0.9 \leq x \leq 1.2;$ $0.40 \leq y \leq 0.60; z \leq 0.2$ ) and $\text{Li}_x'\text{CoO}_2$ ( $0.9 \leq x' \leq 1.1$ ) having R3m rhombohedral structure.				
ST	secondary battery cathode lithium transition metal oxide mixt; manganese nickel lithium oxide cathode mixt battery; cobalt lithium oxide cathode mixt battery				
IT	Battery cathodes (cathodes containing (substituted) lithium manganese nickel oxide and rhombohedral lithium cobalt oxide for secondary lithium batteries)				
IT	128975-24-6, Lithium manganese nickel oxide ( $\text{Li}_2\text{MnNiO}_4$ ) 179186-44-8, Lithium manganese nickel oxide ( $\text{LiMn}_{0.4}\text{Ni}_{0.6}\text{O}_2$ ) 287718-96-1, Lithium manganese nickel oxide ( $\text{LiMn}_{0.45}\text{Ni}_{0.55}\text{O}_2$ ) 405890-05-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 405890-06-4, Chromium lithium manganese nickel oxide ( $\text{Cr}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 405890-07-5, Iron lithium manganese nickel oxide ( $\text{Fe}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) 405890-08-6, Aluminum lithium manganese nickel oxide ( $\text{Al}_{0.1}\text{LiMn}_{0.45}\text{Ni}_{0.45}\text{O}_2$ ) RL: DEV (Device component use); USES (Uses) (cathodes containing (substituted) lithium manganese nickel oxide and rhombohedral lithium cobalt oxide for secondary lithium batteries)				
IT	12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) RL: DEV (Device component use); PRP (Properties); USES (Uses) (cathodes containing (substituted) lithium manganese nickel oxide and rhombohedral lithium cobalt oxide for secondary lithium batteries)				

L3 ANSWER 123 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2002:253365 CAPLUS  
 DOCUMENT NUMBER: 136:265836  
 TITLE: Secondary lithium battery  
 INVENTOR(S): Suhara, Manabu; Sunahara, Kazuo; Kimura, Takashi;  
 Mihara, Takuya  
 PATENT ASSIGNEE(S): Seimi Chemical Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2002100356	A2	20020405	JP 2000-289761	20000925
PRIORITY APPLN. INFO.:				JP 2000-289761	20000925
TI	Secondary lithium battery				
AB	The battery uses a cathode active mass mixture containing $\text{Li}_x\text{Ni}_y\text{Mn}_{1-y-z}\text{M}_z\text{O}_2$ ( $\text{M} = \text{Fe}, \text{Co}, \text{Cr}, \text{and/or Al}; 0.9 \leq x \leq 1.2,$				

0.40 ≤ x ≤ 0.60; z ≤ 0.2) and Li<sub>x</sub>Ni<sub>1-x</sub>M'<sub>2</sub>O<sub>4</sub> (M' = Co and/or Mn, 0.75 ≤ p ≤ 0.95) having an R3m rhombohedral structure.

ST secondary lithium battery cathode active mass mixt; lithium nickel manganese oxide cathode mixt secondary battery

IT Battery cathodes  
(cathodes containing lithium manganese nickel oxide and rhombohedral lithium nickel oxide for lithium batteries)

IT 128975-24-6, Lithium manganese nickel oxide (Li<sub>2</sub>MnNiO<sub>4</sub>) 179186-42-6, Lithium manganese nickel oxide (LiMn<sub>0.6</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 179186-44-8, Lithium manganese nickel oxide (LiMn<sub>0.4</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 216588-85-1, Cobalt lithium nickel oxide (Co<sub>0.18</sub>LiNi<sub>0.82</sub>O<sub>2</sub>) 405240-98-4, Cobalt lithium manganese nickel oxide (Co<sub>0.11</sub>LiMn<sub>0.44</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405240-99-5, Chromium lithium manganese nickel oxide (Cr<sub>0.11</sub>LiMn<sub>0.44</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405241-00-1, Iron lithium manganese nickel oxide (Fe<sub>0.11</sub>LiMn<sub>0.44</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 405241-01-2, Aluminum lithium manganese nickel oxide (Al<sub>0.11</sub>LiMn<sub>0.44</sub>Ni<sub>0.45</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)  
(cathodes containing lithium manganese nickel oxide and rhombohedral lithium nickel oxide for lithium batteries)

IT 149887-20-7, Lithium manganese nickel oxide (LiMn<sub>0.1</sub>Ni<sub>0.9</sub>O<sub>2</sub>) 287718-96-1, Lithium manganese nickel oxide (LiMn<sub>0.45</sub>Ni<sub>0.55</sub>O<sub>2</sub>)

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(cathodes containing lithium manganese nickel oxide and rhombohedral lithium nickel oxide for lithium batteries)

L3 ANSWER 124 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:216203 CAPLUS

DOCUMENT NUMBER: 136:250258

TITLE: Method for preparation of lithiated oxide materials with a well layered crystal structure for battery cathodes

INVENTOR(S): Paulsen, Jens Martin; Kieu, Loan Yen; Ammundsen, Brett Graeme

PATENT ASSIGNEE(S): Ilion Technology Corporation, USA; Pacific Lithium New Zealand Limited

SOURCE: Eur. Pat. Appl., 25 pp.  
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1189296	A2	20020320	EP 2001-302209	20010309
EP 1189296	A3	20050511		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 2003022063	A1	20030130	US 2001-799935	20010306
US 6660432	B2	20031209		
JP 2002110167	A2	20020412	JP 2001-181459	20010615
JP 3571671	B2	20040929		

PRIORITY APPLN. INFO.: US 2000-232551P P 20000914

TI Method for preparation of lithiated oxide materials with a well layered crystal structure for battery cathodes

ST battery cathode lithiated oxide material

IT Battery cathodes  
Crystal structure  
Laminated materials  
(method for preparation of lithiated oxide materials with well layered crystal structure for battery cathodes)

IT 142395-58-2P, Lithium nickel oxide (Li<sub>0.45</sub>Ni<sub>0.55</sub>O) 403985-61-5P, Lithium nickel oxide (Li<sub>0.89</sub>Ni<sub>1.11</sub>O<sub>2</sub>) 403985-62-6P, Cobalt lithium oxide (Co<sub>0.98</sub>Li<sub>1.02</sub>O<sub>2</sub>) 403985-64-8P, Cobalt lithium oxide (Co<sub>0.89</sub>Li<sub>1.11</sub>O<sub>2</sub>) 403985-65-9P, Cobalt lithium manganese nickel oxide (Co<sub>0.05</sub>Li<sub>1.1</sub>Mn<sub>0.42</sub>Ni<sub>0.43</sub>O<sub>2</sub>) 403985-66-0P, Cobalt lithium

manganese nickel oxide (Co<sub>0.04</sub>Li<sub>1.13</sub>Mn<sub>0.41</sub>Ni<sub>0.42</sub>O<sub>2</sub>) 403985-67-1P  
 , Cobalt lithium manganese nickel oxide (Co<sub>0.09</sub>Li<sub>1.08</sub>Mn<sub>0.41</sub>Ni<sub>0.41</sub>O<sub>2</sub>)  
 403985-68-2P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.09</sub>Li<sub>1.12</sub>Mn<sub>0.39</sub>Ni<sub>0.39</sub>O<sub>2</sub>) 403985-69-3P, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.16</sub>Li<sub>1.06</sub>Mn<sub>0.39</sub>Ni<sub>0.39</sub>O<sub>2</sub>) 403985-70-6P, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.15</sub>Li<sub>1.11</sub>Mn<sub>0.37</sub>Ni<sub>0.37</sub>O<sub>2</sub>) 403985-71-7P, Cobalt  
 manganese nickel hydroxide oxide 403985-72-8P 403985-73-9P, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.15</sub>Li<sub>1.09</sub>Mn<sub>0.38</sub>Ni<sub>0.38</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
 preparation); PREP (Preparation); USES (Uses)  
 (method for preparation of lithiated oxide materials with well layered  
 crystal structure for battery cathodes)

L3 ANSWER 125 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:29020 CAPLUS

DOCUMENT NUMBER: 134:88776

TITLE: Cathode active mass, cathodes, secondary nonaqueous  
 electrolyte batteries, and manufacture of  
 the cathode active mass

INVENTOR(S): Yanai, Atsushi; Yanaida, Katsunori; Maeda, Takeshi;  
 Funabashi, Atsuhiko; Noma, Toshiyuki; Yonezu, Ikuo

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001006672	A2	20010112	JP 1999-176974	19990623
JP 3649953	B2	20050518		
US 6368749	B1	20020409	US 2000-597095	20000620
			JP 1999-176974	A 19990623

PRIORITY APPLN. INFO.:

TI Cathode active mass, cathodes, secondary nonaqueous electrolyte  
 batteries, and manufacture of the cathode active mass

ST secondary lithium battery cathode nickel cobalt oxide additive;  
 aluminum sulfate secondary lithium battery cathode additive

IT Battery cathodes  
 (lithium nickel cobalt oxide cathode active mass containing alum additives  
 for secondary lithium batteries)

IT 12031-65-1, Lithium nickel oxide (LiNiO<sub>2</sub>) 12190-79-3, Cobalt lithium  
 oxide (CoLiO<sub>2</sub>) 101920-93-8, Cobalt lithium nickel oxide (Co<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>)  
 118819-08-2, Cobalt lithium manganese oxide (Co<sub>0.5</sub>LiMn<sub>0.5</sub>O<sub>2</sub>)  
 124320-82-7, Lithium nickel titanium oxide (Li<sub>2</sub>NiTiO<sub>4</sub>) 128975-24-6,  
 Lithium manganese nickel oxide (LiMn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 140418-66-2, Iron  
 lithium nickel oxide (Fe<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>) 155604-51-6, Chromium lithium  
 nickel oxide (Cr<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>) 172484-43-4, Aluminum lithium nickel oxide  
 (Al<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>) 317831-74-6, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.1</sub>LiMn<sub>0.5</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 317831-75-7, Lithium nickel zinc oxide  
 (LiNi<sub>0.5</sub>Zn<sub>0.5</sub>O<sub>2</sub>) 317831-76-8, Lithium magnesium nickel oxide  
 (LiMg<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 317831-77-9, Copper lithium nickel oxide  
 (Cu<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>) 317831-78-0, Gallium lithium nickel oxide  
 (Ga<sub>0.5</sub>LiNi<sub>0.5</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(lithium nickel cobalt oxide cathode active mass containing alum additives  
 for secondary lithium batteries)

IT 7784-25-0, Aluminum ammonium sulfate [AlNH<sub>4</sub>(SO<sub>4</sub>)<sub>2</sub>] 10043-67-1, Aluminum  
 potassium sulfate [AlK(SO<sub>4</sub>)<sub>2</sub>] 10102-71-3, Aluminum sodium sulfate  
 [AlNa(SO<sub>4</sub>)<sub>2</sub>] 13530-57-9, Aluminum rubidium sulfate [AlRb(SO<sub>4</sub>)<sub>2</sub>]  
 14284-36-7, Aluminum cesium sulfate [AlCs(SO<sub>4</sub>)<sub>2</sub>]

RL: MOA (Modifier or additive use); USES (Uses)

(lithium nickel cobalt oxide cathode active mass containing alum additives  
 for secondary lithium batteries)

L3 ANSWER 126 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:723269 CAPLUS

DOCUMENT NUMBER: 133:269461

TITLE: Nonaqueous lithium electrolyte secondary battery

INVENTOR(S): Watanabe, Shoichiro; Iwamoto, Kazuya; Ueda, Atsushi; Nunome, Jun; Koshina, Hizuru

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 9 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1043794	A2	20001011	EP 2000-102959	20000214
EP 1043794	A3	20021218		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6165647	A	20001226	US 1999-289589	19990409
CN 1270424	A	20001018	CN 2000-103653	20000229
PRIORITY APPLN. INFO.:			US 1999-289589	A 19990409

OTHER SOURCE(S): MARPAT 133:269461

TI Nonaqueous lithium electrolyte secondary battery

AB A battery (excellent in high temperature storage characteristics) comprises a pos. electrode having a pos. electrode active material containing an transition metal complex oxide containing lithium, a neg. electrode containing a neg. electrode material capable of storing and releasing a lithium ion, and an electrolytic solution containing a nonaq. solvent, an electrolyte, and an organic compound expressed in formula I, where R1, R2, R3, R4, R5, and R6 have individually at least one of H and a group containing a vinyl group, and the number of H substituent is four or less.

ST nonaq electrolyte secondary battery

IT Fatty acids, uses

RL: DEV (Device component use); USES (Uses)  
(esters, carbonates; nonaq. electrolyte lithium secondary battery)

IT Secondary batteries

(lithium; nonaq. electrolyte lithium secondary battery)

IT Intermetallic compounds

RL: DEV (Device component use); USES (Uses)  
(lithium; nonaq. electrolyte lithium secondary battery)

IT Coordination compounds

Inorganic compounds

Organic compounds, uses

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte lithium secondary battery)

IT Battery electrolytes

(nonaq. electrolyte secondary battery)

IT Fluoropolymers, uses

Styrene-butadiene rubber, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(nonaq. electrolyte secondary battery)

IT Lithium alloy

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte lithium secondary battery)

IT 79-20-9, Methyl acetate 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 872-36-6, 1,3-Dioxol-2-one 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate 174180-05-3, Cobalt lithium oxide CoLiO-1.202 174180-06-4, Lithium nickel oxide LiO-1.2NiO2

188405-67-6, Lithium manganese oxide  $\text{LiO}-1.2\text{Mn}_2\text{O}_4$  296800-04-9, Lithium manganese oxide ( $\text{LiO}-1.2\text{MnO}_2$ ) 296800-06-1, Cobalt lithium nickel oxide ( $\text{CoO}-0.9\text{LiO}-1.2\text{NiO}-1.1\text{O}_2$ ) 296800-08-3, Cobalt lithium vanadium oxide ( $\text{CoO}-0.9\text{LiO}-1.2\text{VO}-0.02-0.1\text{O}_2$ ) 296800-10-7, Lithium nickel titanium oxide ( $\text{LiO}-1.2\text{NiO}-1.1\text{TiO}-0.9\text{O}_2$ ) 296800-12-9, Lithium nickel vanadium oxide ( $\text{LiO}-1.2\text{NiO}-1.1\text{VO}-0.9\text{O}_2$ ) 296800-15-2, Lithium manganese nickel oxide ( $\text{LiO}-1.2\text{MnO}-0.9\text{NiO}-1.1\text{O}_2$ ) 296800-18-5, Iron lithium nickel oxide ( $\text{FeO}-0.9\text{LiO}-1.2\text{NiO}-1.1\text{O}_2$ ) 296800-20-9, Cobalt lithium nickel titanium oxide ( $(\text{Co},\text{Ni},\text{Ti})\text{LiO}-1.2\text{O}_2$ ) 296800-21-0, Cobalt lithium manganese nickel oxide ( $(\text{Co},\text{Mn},\text{Ni})\text{LiO}-1.2\text{O}_2$ ) 296800-22-1, Aluminum cobalt lithium nickel oxide ( $(\text{Al},\text{Co},\text{Ni})\text{LiO}-1.2\text{O}_2$ ) 296800-23-2, Cobalt lithium magnesium nickel oxide ( $(\text{Co},\text{Mg},\text{Ni})\text{LiO}-1.2\text{O}_2$ ) 296800-25-4, Cobalt iron lithium nickel oxide ( $(\text{Co},\text{Fe},\text{Ni})\text{LiO}-1.2\text{O}_2$ ) 296800-27-6, Cobalt lithium nickel zirconium oxide ( $(\text{Co},\text{Ni},\text{Zr})\text{LiO}-1.2\text{O}_2$ ) 296800-28-7, Lithium manganese sodium oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{NaO}-0.9\text{O}_4$ ) 296800-30-1, Lithium magnesium manganese oxide ( $\text{LiO}-1.2\text{MgO}-0.9\text{Mn}_1.1-2\text{O}_4$ ) 296800-32-3, Lithium manganese scandium oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{ScO}-0.9\text{O}_4$ ) 296800-35-6, Lithium manganese yttrium oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{YO}-0.9\text{O}_4$ ) 296800-38-9, Iron lithium manganese oxide ( $\text{FeO}-0.9\text{LiO}-1.2\text{Mn}_1.1-2\text{O}_4$ ) 296800-40-3, Cobalt lithium manganese oxide ( $\text{CoO}-0.9\text{LiO}-1.2\text{Mn}_1.1-2\text{O}_4$ ) 296800-43-6, Lithium manganese nickel oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{NiO}-0.9\text{O}_4$ ) 296800-45-8, Lithium manganese titanium oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{TiO}-0.9\text{O}_4$ ) 296800-47-0, Lithium manganese zirconium oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{ZrO}-0.9\text{O}_4$ ) 296800-49-2, Copper lithium manganese oxide ( $\text{CuO}-0.9\text{LiO}-1.2\text{Mn}_1.1-2\text{O}_4$ ) 296800-51-6, Lithium manganese zinc oxide ( $\text{LiO}-1.2\text{Mn}_1.1-2\text{ZnO}-0.9\text{O}_4$ ) 296800-52-7, Aluminum lithium manganese oxide ( $\text{AlO}-0.9\text{LiO}-1.2\text{Mn}_1.1-2\text{O}_4$ ) 296800-54-9, Lead lithium manganese oxide ( $\text{PbO}-0.9\text{LiO}-1.2\text{Mn}_1.1-2\text{O}_4$ ) 296800-56-1, Antimony lithium manganese oxide ( $\text{SbO}-0.9\text{LiO}-1.2\text{Mn}_1.1-2\text{O}_4$ )  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)  
 IT 91-14-5 105-06-6, p-Divinylbenzene 108-57-6 3048-52-0,  
 1,3,5-Trivinylbenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)  
 IT 9003-07-0, Polypropylene  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte secondary battery)  
 IT 9003-55-8  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (styrene-butadiene rubber, nonaq. electrolyte secondary battery  
 )

L3 ANSWER 127 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:814077 CAPLUS

DOCUMENT NUMBER: 132:52401

TITLE: Secondary nonaqueous electrolyte lithium batteries using specific electrolyte solutions

INVENTOR(S): Sakaguchi, Taeko; Sunakawa, Takuya; Fujimoto, Hiroyuki; Watanabe, Hiroshi; Noma, Toshiyuki; Nishio, Akiharu

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11354156	A2	19991224	JP 1998-157759	19980605
PRIORITY APPLN. INFO.:			JP 1998-157759	19980605

OTHER SOURCE(S): MARPAT 132:52401

TI Secondary nonaqueous electrolyte lithium batteries using specific electrolyte solutions

AB The batteries use cathodes of  $\text{Li}_a\text{Co}_b\text{Mn}_{1-b}\text{-cO}_2$  (M = Mn, B, Mg,



Al, Si, Ca, Ti, V, Fe, Cu, Zn, and/or Ga;  $a = 0-1.2$ ;  $b, c = 0.01-0.4$ ;  $b + c = 0.02-0.5$ ), anodes of Li or Li-intercalatable substances, separators, and nonaq. electrolyte solns. containing electrolyte salts selected from  $\text{LiN}(\text{CnF}_{2n+1}\text{SO}_2)$  ( $\text{CmF}_{2m+1}\text{SO}_2$ ) and  $\text{LiC}(\text{CnF}_{2n+1}\text{SO}_2)_2(\text{CmF}_{2m+1}\text{SO}_2)$  ( $n, m = 1-5$ ;  $n = m \neq 1$ ) and solvents including 5- or 6-membered heterocycles containing O, S, and/or N atoms. The batteries have long cycle life.

ST battery cathode lithium imide electrolyte; heterocyclic solvent  
lithium electrolyte battery; cycle life battery  
electrolyte lithium imide

IT Secondary batteries  
(lithium; secondary Li batteries using mixed oxide cathodes  
and Li electrolytes in nonaq. heterocyclic solvents for long cycle  
life)

IT Heterocyclic compounds  
RL: DEV (Device component use); USES (Uses)  
(nitrogen; secondary Li batteries using mixed oxide cathodes  
and Li electrolytes in nonaq. heterocyclic solvents for long cycle  
life)

IT Heterocyclic compounds  
RL: DEV (Device component use); USES (Uses)  
(oxygen; secondary Li batteries using mixed oxide cathodes  
and Li electrolytes in nonaq. heterocyclic solvents for long cycle  
life)

IT Battery cathodes  
Battery electrolytes  
(secondary Li batteries using mixed oxide cathodes and Li  
electrolytes in nonaq. heterocyclic solvents for long cycle life)

IT Heterocyclic compounds  
RL: DEV (Device component use); USES (Uses)  
(sulfur; secondary Li batteries using mixed oxide cathodes  
and Li electrolytes in nonaq. heterocyclic solvents for long cycle  
life)

IT 109-02-4, N-Methylmorpholine 126-33-0, Sulfolane 288-14-2, Isoxazole  
872-36-6, Vinylene carbonate 872-50-4, uses 1120-71-4, 1,3-Propane  
sultone 28452-93-9, Butadiene sulfone 119229-99-1 132843-44-8,  
Lithium bis(pentafluoroethylsulfonyl)imide 176719-70-3, Lithium  
trifluoromethanesulfonyl(nonafluorobutanesulfonyl)imide 210406-62-5  
227098-71-7 252877-06-8 252877-07-9, Cobalt lithium manganese nickel  
oxide ( $\text{Co}_{0.6}\text{LiMn}_{0.3}\text{Ni}_{0.1}\text{O}_2$ )  
RL: DEV (Device component use); USES (Uses)  
(secondary Li batteries using mixed oxide cathodes and Li  
electrolytes in nonaq. heterocyclic solvents for long cycle life)

IT 191024-83-6P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.1}\text{Ni}_{0.5}\text{O}_2$ )  
193215-05-3P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.2}\text{Ni}_{0.6}\text{O}_2$ )  
193215-53-1P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{LiMn}_{0.3}\text{Ni}_{0.5}\text{O}_2$ )  
193215-92-8P, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.1}\text{LiMn}_{0.4}\text{Ni}_{0.5}\text{O}_2$ ) 223923-05-5P, Cobalt lithium manganese nickel  
oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.1}\text{Ni}_{0.6}\text{O}_2$ ) 244304-31-2P, Cobalt lithium manganese  
nickel oxide ( $\text{Co}_{0.01}\text{LiMn}_{0.01}\text{Ni}_{0.98}\text{O}_2$ ) 244304-32-3P, Cobalt lithium  
manganese nickel oxide ( $\text{Co}_{0.01}\text{LiMn}_{0.2}\text{Ni}_{0.79}\text{O}_2$ ) 244304-33-4P,  
Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.01}\text{LiMn}_{0.4}\text{Ni}_{0.59}\text{O}_2$ )  
244304-34-5P, Cobalt lithium manganese nickel oxide  
( $\text{Co}_{0.2}\text{LiMn}_{0.01}\text{Ni}_{0.79}\text{O}_2$ ) 244304-35-6P, Cobalt lithium manganese nickel  
oxide ( $\text{Co}_{0.4}\text{LiMn}_{0.01}\text{Ni}_{0.59}\text{O}_2$ ) 244304-36-7P, Cobalt lithium nickel borate  
oxide ( $\text{Co}_{0.3}\text{LiNi}_{0.6}(\text{BO}_3)_{0.1}\text{O}_{1.7}$ ) 244304-37-8P, Cobalt lithium magnesium  
nickel oxide ( $\text{Co}_{0.3}\text{LiMg}_{0.1}\text{Ni}_{0.6}\text{O}_2$ ) 244304-38-9P, Aluminum cobalt lithium  
nickel oxide ( $\text{Al}_{0.1}\text{Co}_{0.3}\text{LiNi}_{0.6}\text{O}_2$ ) 244304-40-3P, Calcium cobalt lithium  
nickel oxide ( $\text{Ca}_{0.1}\text{Co}_{0.3}\text{LiNi}_{0.6}\text{O}_2$ ) 244304-42-5P, Cobalt lithium nickel  
titanium oxide ( $\text{Co}_{0.3}\text{LiNi}_{0.6}\text{Ti}_{0.1}\text{O}_2$ ) 244304-43-6P, Cobalt lithium nickel  
vanadium oxide ( $\text{Co}_{0.3}\text{LiNi}_{0.6}\text{V}_{0.1}\text{O}_2$ ) 244304-45-8P, Cobalt iron lithium  
nickel oxide ( $\text{Co}_{0.3}\text{Fe}_{0.1}\text{LiNi}_{0.6}\text{O}_2$ ) 244304-46-9P, Cobalt copper lithium  
nickel oxide ( $\text{Co}_{0.3}\text{Cu}_{0.1}\text{LiNi}_{0.6}\text{O}_2$ ) 244304-47-0P, Cobalt lithium nickel  
zinc oxide ( $\text{Co}_{0.3}\text{LiNi}_{0.6}\text{Zn}_{0.1}\text{O}_2$ ) 244304-48-1P, Cobalt gallium lithium  
nickel oxide ( $\text{Co}_{0.3}\text{Ga}_{0.1}\text{LiNi}_{0.6}\text{O}_2$ ) 252877-05-7P, Cobalt lithium nickel  
oxide silicate ( $\text{Co}_{0.3}\text{LiNi}_{0.6}\text{O}_{1.6}(\text{SiO}_4)_{0.1}$ )

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP  
(Preparation); USES (Uses)  
(secondary Li batteries using mixed oxide cathodes and Li  
electrolytes in nonaq. heterocyclic solvents for long cycle life)

L3 ANSWER 128 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1999:706080 CAPLUS  
DOCUMENT NUMBER: 131:312432  
TITLE: Cathode active mass for secondary lithium  
batteries and batteries using them  
INVENTOR(S): Miyashita, Takahiro; Kitamura, Hajime; Yamato, Koji;  
Ota, Satoshi  
PATENT ASSIGNEE(S): Chuo Denki Kogyo Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11307094	A2	19991105	JP 1998-109746	19980420
PRIORITY APPLN. INFO.:			JP 1998-109746	19980420
TI	Cathode active mass for secondary lithium batteries and batteries using them			
AB	The title cathode active mass comprises $\text{Li}_{1-a}\text{Ni}_{1-b}\text{Co}_{1-c}\text{Mn}_{1-d}\text{O}_2$ (M is an addnl. element; $a = -0.15$ to $0.10$ ; $b = 0.02$ - $0.45$ ; $c = 0$ - $0.50$ ; $d = 0$ - $0.20$ ) and shows remained Li amount $x = 0.20$ - $0.30$ after Li desorption and heat generation $0$ - $30\%$ while heating at $175$ - $300^\circ$ vs. that of $\text{Li}_x\text{NiO}_2$ . Secondary batteries using the cathodes are also claimed. The active mass provides high capacity, long cycle life, low cost, and good thermal stability.			
ST	lithium nickel manganese cobalt oxide cathode; battery lithium mixed oxide cathode			
IT	Battery cathodes (Li mixed oxides containing Ni, Mn, and Co for cathodes in batteries)			
IT	Secondary batteries (lithium; Li mixed oxides containing Ni, Mn, and Co for cathodes in batteries)			
IT	Alkali metals, uses Alkaline earth metals Group IIB elements Group IIIA elements Group IVA elements Transition metals, uses			
	RL: DEV (Device component use); USES (Uses) (mixed oxides containing; Li mixed oxides containing Ni, Mn, and Co for cathodes in batteries)			
IT	247565-29-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.15}\text{Li}_{1.05}\text{Mn}_{0.2}\text{Ni}_{0.65}\text{O}_2$ ) 247565-30-6, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.09}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-32-8, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.09}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-33-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.09}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-34-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.09}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-35-1, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.09}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-36-2, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.09}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-37-3, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.08}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-38-4, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.17}\text{Li}_{1.15}\text{Mn}_{0.04}\text{Ni}_{0.79}\text{O}_2$ ) 247565-39-5, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.05}\text{Mn}_{0.02}\text{Ni}_{0.79}\text{O}_2$ ) 247565-40-8, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.05}\text{Mn}_{0.08}\text{Ni}_{0.79}\text{O}_2$ ) 247565-41-9, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.05}\text{Mn}_{0.3}\text{Ni}_{0.5}\text{O}_2$ ) 247565-42-0, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.2}\text{Li}_{1.05}\text{Mn}_{0.4}\text{Ni}_{0.4}\text{O}_2$ ) 247565-43-1, Lithium manganese nickel oxide			

(Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 247565-45-3, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.03</sub>Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.68</sub>O<sub>2</sub>) 247565-47-5, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.05</sub>Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 247565-48-6, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.08</sub>Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.63</sub>O<sub>2</sub>) 247565-50-0, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.1</sub>Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 247565-51-1, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.15</sub>Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.55</sub>O<sub>2</sub>) 247565-52-2,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.25</sub>Li<sub>1.05</sub>Mn<sub>0.3</sub>Ni<sub>0.45</sub>O<sub>2</sub>)  
 247565-53-3 247565-54-4 247565-55-5 247565-57-7 247565-59-9  
 247565-61-3 247565-63-5 247565-65-7 247565-66-8 247565-69-1  
 247565-71-5 247565-73-7 247565-76-0 247565-77-1 247565-78-2  
 247565-79-3 247565-80-6 247565-81-7 247565-82-8

RL: DEV (Device component use); USES (Uses)

(Li mixed oxides containing Ni, Mn, and Co for cathodes in  
 batteries)

L3 ANSWER 129 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:636148 CAPLUS

DOCUMENT NUMBER: 131:245574

TITLE: Composite oxide cathode material for lithium secondary  
 battery

INVENTOR(S): Sunagawa, Takuya; Watanabe, Hiroshi; Nohma, Toshiyuki;  
 Nishio, Koji

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 13 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 944125	A1	19990922	EP 1999-104100	19990318
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 11273677	A2	19991008	JP 1998-92734	19980319
JP 3524762	B2	20040510		
CA 2265372	AA	19990919	CA 1999-2265372	19990316
CA 2265372	C	20041102		
US 6333128	B1	20011225	US 1999-272554	19990319

PRIORITY APPLN. INFO.: JP 1998-92734 A 19980319

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Composite oxide cathode material for lithium secondary battery

AB A cathode material for a lithium secondary battery comprises a  
 composite oxide powder with median diameter 3.0-20.0  $\mu$ m containing  $\leq 10$   
 volume%  $\leq 1\text{-}\mu$ m particles, represented by the general formula  
 $\text{Li}_a\text{Co}_b\text{Mn}_c\text{Ni}_{1-b-c}\text{O}_2$ , where M is  $\geq 1$  of B, Mg, Al, Si, Ca, Sc, Ti, V,  
 Cr, Mn, Fe, Cu, Zn, Ga, Ge, Y, Nb, Mo, Ru, Rh, Pd, Ag, Cd, In and Sn;  
 $0 \leq a \leq 1.2$ ;  $0.01 \leq b \leq 0.4$ ;  $0.01 \leq c \leq 0.4$ ;  
 and  $0.02 \leq b+c \leq 0.5$ . The lithium secondary battery  
 exhibits improved charge-discharge cycle characteristics.

ST composite oxide cathode lithium secondary battery

IT Battery cathodes  
 (composite oxide cathode material for lithium secondary battery  
 )

IT Secondary batteries  
 (lithium; composite oxide cathode material for lithium secondary  
 battery)

IT 120062-99-9, Cobalt copper lithium nickel oxide 177997-11-4, Cobalt  
 gallium lithium nickel oxide 177997-12-5, Boron cobalt lithium nickel  
 oxide 177997-13-6, Aluminum cobalt lithium nickel oxide 177997-14-7,  
 Cobalt indium lithium nickel oxide 177997-15-8, Cobalt lithium nickel  
 tin oxide 180997-14-2, Cobalt lithium magnesium nickel oxide  
 182442-94-0, Cobalt lithium nickel vanadium oxide 182442-95-1, Cobalt  
 lithium manganese nickel oxide 182442-96-2, Cobalt iron lithium nickel

oxide 182442-97-3, Cobalt lithium nickel zinc oxide 191024-83-6,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.1</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 193215-05-3,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.2</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-53-1,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
 193215-92-8, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 210353-05-2, Calcium cobalt lithium nickel oxide  
 223923-05-5, Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.1</sub>Ni<sub>0.6</sub>O<sub>2</sub>)  
 244304-18-5, Cobalt lithium nickel silicon oxide 244304-19-6, Cobalt  
 lithium nickel scandium oxide 244304-20-9, Cobalt lithium nickel  
 titanium oxide 244304-21-0, Chromium cobalt lithium nickel oxide  
 244304-22-1, Cobalt germanium lithium nickel oxide 244304-23-2, Cobalt  
 lithium nickel yttrium oxide 244304-24-3, Cobalt lithium nickel niobium  
 oxide 244304-25-4, Cobalt lithium molybdenum nickel oxide 244304-26-5,  
 Cobalt lithium nickel ruthenium oxide 244304-27-6, Cobalt lithium nickel  
 rhodium oxide 244304-28-7, Cobalt lithium nickel palladium oxide  
 244304-29-8, Cobalt lithium nickel silver oxide 244304-30-1, Cadmium  
 cobalt lithium nickel oxide 244304-31-2, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.01</sub>LiMn<sub>0.01</sub>Ni<sub>0.98</sub>O<sub>2</sub>) 244304-32-3, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.01</sub>LiMn<sub>0.2</sub>Ni<sub>0.79</sub>O<sub>2</sub>) 244304-33-4, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.01</sub>LiMn<sub>0.4</sub>Ni<sub>0.59</sub>O<sub>2</sub>) 244304-34-5, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.01</sub>Ni<sub>0.79</sub>O<sub>2</sub>) 244304-35-6,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.4</sub>LiMn<sub>0.01</sub>Ni<sub>0.59</sub>O<sub>2</sub>)  
 244304-36-7, Cobalt lithium nickel borate oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>(BO<sub>3</sub>)<sub>0.1</sub>O<sub>1.7</sub>)  
 244304-37-8, Cobalt lithium magnesium nickel oxide (Co<sub>0.3</sub>LiMg<sub>0.1</sub>Ni<sub>0.6</sub>O<sub>2</sub>)  
 244304-38-9, Aluminum cobalt lithium nickel oxide (Al<sub>0.1</sub>Co<sub>0.3</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-39-0, Cobalt lithium nickel scandium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Sc<sub>0.1</sub>O<sub>2</sub>)  
 244304-40-3, Calcium cobalt lithium nickel oxide (Ca<sub>0.1</sub>Co<sub>0.3</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-42-5, Cobalt lithium nickel titanium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Ti<sub>0.1</sub>O<sub>2</sub>)  
 244304-43-6, Cobalt lithium nickel vanadium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>V<sub>0.1</sub>O<sub>2</sub>)  
 244304-44-7, Chromium cobalt lithium nickel oxide (Cr<sub>0.1</sub>Co<sub>0.3</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-45-8, Cobalt iron lithium nickel oxide (Co<sub>0.3</sub>Fe<sub>0.1</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-46-9, Cobalt copper lithium nickel oxide (Co<sub>0.3</sub>Cu<sub>0.1</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-47-0, Cobalt lithium nickel zinc oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Zn<sub>0.1</sub>O<sub>2</sub>)  
 244304-48-1, Cobalt gallium lithium nickel oxide (Co<sub>0.3</sub>Ga<sub>0.1</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-49-2, Cobalt germanium lithium nickel oxide (Co<sub>0.3</sub>Ge<sub>0.1</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-50-5, Cobalt lithium nickel yttrium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Y<sub>0.1</sub>O<sub>2</sub>)  
 244304-51-6, Cobalt lithium nickel niobium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Nb<sub>0.1</sub>O<sub>2</sub>)  
 244304-52-7, Cobalt lithium molybdenum nickel oxide (Co<sub>0.3</sub>LiMo<sub>0.1</sub>Ni<sub>0.6</sub>O<sub>2</sub>)  
 244304-53-8, Cobalt lithium nickel ruthenium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Ru<sub>0.1</sub>O<sub>2</sub>)  
 244304-54-9, Cobalt lithium nickel rhodium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Rh<sub>0.1</sub>O<sub>2</sub>)  
 244304-55-0, Cobalt lithium nickel palladium oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Pd<sub>0.1</sub>O<sub>2</sub>)  
 244304-56-1, Cobalt lithium nickel silver oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Ag<sub>0.1</sub>O<sub>2</sub>)  
 244304-57-2, Cadmium cobalt lithium nickel oxide (Cd<sub>0.1</sub>Co<sub>0.3</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-58-3, Cobalt indium lithium nickel oxide (Co<sub>0.3</sub>In<sub>0.1</sub>LiNi<sub>0.6</sub>O<sub>2</sub>)  
 244304-59-4, Cobalt lithium nickel tin oxide (Co<sub>0.3</sub>LiNi<sub>0.6</sub>Sn<sub>0.1</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); TEM (Technical or engineered material  
 use); USES (Uses)  
 (composite oxide cathode material for lithium secondary battery  
 )

L3 ANSWER 130 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:703437 CAPLUS

DOCUMENT NUMBER: 129:304531

TITLE: Cathode material for use in nonaqueous-electrolyte  
 battery, its preparation, and  
 nonaqueous-electrolyte battery having  
 cathode prepared from this material

INVENTOR(S): Sunagawa, Takuya; Watanabe, Hiroshi; Ohshita, Ryuji;  
 Fujimoto, Masahisa; Nohma, Toshiyuki; Nishio, Koji

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 22 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 872450	A1	19981021	EP 1998-106725	19980414
EP 872450	B1	20031105		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 10289731	A2	19981027	JP 1997-97239	19970415
JP 11025957	A2	19990129	JP 1997-230145	19970827
JP 3561607	B2	20040902		
PRIORITY APPLN. INFO.:			JP 1997-97239	A 19970415
			JP 1997-117341	A 19970508
			JP 1997-230145	A 19970827
REFERENCE COUNT:	7	THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT		
TI	Cathode material for use in nonaqueous-electrolyte battery, its preparation, and nonaqueous-electrolyte battery having cathode prepared from this material			
AB	The title battery includes an anode, a nonaq.-electrolyte, and a cathode using a Li-metal compound oxide as a cathode, which contains at least Ni, Co, and Mn, and has a peak with a full width at half maximum of $\leq 0.22^\circ$ at $2\theta = 18.71 \pm 0.25^\circ$ as measured by the powder x-ray diffraction anal. using a Cu K $\alpha$ x-ray source or employing a cathode material composed of a Li-metal compound oxide which contains at least Ni, Co and Mn, and a nonaq. electrolyte which includes a solvent containing ethylene carbonate and a solute containing $\geq 1$ type of F-containing compound			
ST	lithium metal compd oxide battery cathode; nickel lithium compd oxide battery cathode; cobalt lithium compd oxide battery cathode; manganese lithium compd oxide battery cathode			
IT	Secondary batteries (lithium, lithium-ion; performance of)			
IT	Battery cathodes (lithium-metal compound oxide for use in nonaq.-electrolyte)			
IT	146956-42-5P, Cobalt lithium manganese nickel oxide (Co <sub>0.4</sub> LiMn <sub>0.2</sub> Ni <sub>0.4</sub> O <sub>2</sub> ) 176206-89-6P, Cobalt lithium manganese nickel oxide (Co <sub>0.3</sub> LiMn <sub>0.2</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 179802-94-9P, Cobalt lithium manganese nickel oxide (Co <sub>0.05</sub> LiMn <sub>0.05</sub> Ni <sub>0.9</sub> O <sub>2</sub> ) 179802-96-1P, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.1</sub> Ni <sub>0.7</sub> O <sub>2</sub> ) 190902-70-6P, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.05</sub> Ni <sub>0.85</sub> O <sub>2</sub> ) 191024-83-6P, Cobalt lithium manganese nickel oxide (Co <sub>0.4</sub> LiMn <sub>0.1</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 193214-71-0P 193215-05-3P, Cobalt lithium manganese nickel oxide (Co <sub>0.2</sub> LiMn <sub>0.2</sub> Ni <sub>0.6</sub> O <sub>2</sub> ) 193215-92-8P, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.4</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 214473-55-9P, Cobalt lithium manganese nickel oxide (Co <sub>0.01</sub> LiMn <sub>0.09</sub> Ni <sub>0.9</sub> O <sub>2</sub> ) 214473-56-0P, Cobalt lithium manganese nickel oxide (Co <sub>0.09</sub> LiMn <sub>0.01</sub> Ni <sub>0.9</sub> O <sub>2</sub> ) 214473-57-1P 214473-59-3P 214473-60-6P 214473-63-9P 214473-65-1P 214473-66-2P 214473-68-4P 214473-69-5P 214473-70-8P 214473-71-9P 214473-72-0P 214473-73-1P 214473-74-2P, Cobalt lithium manganese nickel oxide (Co <sub>0.45</sub> LiMn <sub>0.05</sub> Ni <sub>0.5</sub> O <sub>2</sub> ) 214473-75-3P, Cobalt lithium manganese nickel oxide (Co <sub>0.1</sub> LiMn <sub>0.85</sub> Ni <sub>0.05</sub> O <sub>2</sub> ) 214473-76-4P, Cobalt lithium manganese nickel oxide (Co <sub>0.9</sub> LiMn <sub>0.05</sub> Ni <sub>0.05</sub> O <sub>2</sub> ) 214473-77-5P 214473-78-6P 214473-79-7P 214473-80-0P 214473-81-1P 214473-82-2P 214473-85-5P 214473-86-6P 214473-87-7P 214473-88-8P RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses) (cathode material for use in nonaq.-electrolyte battery and its preparation)			
IT	96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 14283-07-9, Lithium fluoroborate 21324-40-3, Phosphate(1-), hexafluoro-, lithium 132843-44-8, Lithium bis(pentafluoroethylsulfonyl)imide RL: DEV (Device component use); USES (Uses) (cathode material for use in nonaq.-electrolyte battery			

containing)

L3 ANSWER 131 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1998:414870 CAPLUS  
DOCUMENT NUMBER: 129:97736  
TITLE: Cathode active material for lithium batteries  
, and its manufacture  
INVENTOR(S): Yasuda, Hideo  
PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 10 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 849817	A2	19980624	EP 1997-122556	19971219
EP 849817	A3	19990324		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CN 1186351	A	19980701	CN 1997-121746	19971219
JP 11213999	A2	19990806	JP 1997-365262	19971219
US 5993998	A	19991130	US 1997-994326	19971219
PRIORITY APPLN. INFO.:			JP 1996-355280	A 19961220
			JP 1997-337961	A 19971121
TI	Cathode active material for lithium batteries, and its manufacture			
ST	lithium battery cathode active material; nickel lithium complex oxide battery cathode			
IT	Battery cathodes (lithium-containing complex nickel oxide active material for)			
IT	209668-05-3P, Cobalt lithium nickel oxide (Co0.02Li1.8Ni0.98O2) 209668-06-4P, Cobalt lithium nickel oxide (Co0.05Li1.4Ni0.95O2) 209668-08-6P, Cobalt lithium nickel oxide (Co0.1Li1.8Ni0.90O2) 209668-09-7P, Cobalt lithium nickel oxide (Co0.05Li2.2Ni0.95O2) 209668-10-0P, Cobalt lithium nickel oxide (Co0.08Li1.9Ni0.92O2) RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses) (cathode active material for lithium batteries and its manufacture)			
IT	177997-13-6, Aluminum cobalt lithium nickel oxide 182442-95-1, Cobalt lithium manganese nickel oxide 209667-93-6, Cobalt lithium nickel oxide (Co,Ni)Li0.25-2O2) 209667-94-7, Lithium manganese nickel oxide (Li0.25-2(Mn,Ni)O2) 209667-95-8, Aluminum lithium nickel oxide (Al,Ni)Li0.25-2O2) 209667-96-9, Lithium nickel oxide sulfide (Li0.25-2NiO-1O2S0-1) 209667-97-0, Cobalt lithium nickel oxide (Co,Ni)Li1.4-2O2) 209667-98-1, Lithium manganese nickel oxide (Li1.4-2(Mn,Ni)O2) 209667-99-2, Aluminum lithium nickel oxide (Al,Ni)Li1.4-2O2) 209668-00-8, Lithium nickel oxide sulfide (Li1.4-2NiO-1O2S0-1) 209668-01-9, Cobalt lithium nickel oxide (Co0.02-1.6Li0.25-2NiO-1O2) 209668-02-0, Cobalt lithium manganese nickel oxide (Co0.02-0.6Li0.25-2(Mn,Ni)O2) 209668-03-1, Aluminum cobalt lithium nickel oxide (Al,Ni)Co0.02-0.6Li0.25-2O2) 209668-04-2, Cobalt lithium nickel oxide sulfide (Co0.02-0.6Li0.25-2NiO- 1O2S0-1) RL: TEM (Technical or engineered material use); USES (Uses) (cathode active material for lithium batteries and its manufacture)			

L3 ANSWER 132 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 1997:543493 CAPLUS  
DOCUMENT NUMBER: 127:138098  
TITLE: Cathode active material for secondary lithium  
battery, manufacture of this material, and

INVENTOR(S): secondary lithium battery  
Aoki, Takashi; Nagata, Mikito; Tsukamoto, Junichi  
PATENT ASSIGNEE(S): Japan Storage Battery Company Limited, Japan  
SOURCE: Eur. Pat. Appl., 13 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 782206	A1	19970702	EP 1996-120921	19961227
EP 782206	B1	20030416		
R: DE, FR, GB				
JP 09237631	A2	19970909	JP 1996-342516	19961205
CN 1156910	A	19970813	CN 1996-114088	19961227
US 5718989	A	19980217	US 1996-774226	19961227
US 5795558	A	19980818	US 1997-947494	19971009
PRIORITY APPLN. INFO.:			JP 1995-353033	A 19951229
			JP 1996-342516	A 19961205
			US 1996-774226	A3 19961227
TI	Cathode active material for secondary lithium battery,			
	manufacture of this material, and secondary lithium battery			
ST	lithium battery cathode active material; oxide complex lithium			
	battery cathode; nickel cobalt manganese aluminum lithium oxide			
IT	Battery cathodes			
	(active material for secondary lithium)			
IT	12031-65-1P, Lithium nickel oxide (LiNiO <sub>2</sub> ) 113066-89-0P, Cobalt lithium			
	nickel oxide (Co <sub>0.2</sub> LiNi <sub>0.8</sub> O <sub>2</sub> ) 116327-69-6P, Cobalt lithium nickel oxide			
	(Co <sub>0.1</sub> LiNi <sub>0.9</sub> O <sub>2</sub> ) 143623-49-8P, Cobalt lithium nickel oxide			
	(Co <sub>0.25</sub> LiNi <sub>0.75</sub> O <sub>2</sub> ) 143623-51-2P, Cobalt lithium nickel oxide			
	(Co <sub>0.15</sub> LiNi <sub>0.85</sub> O <sub>2</sub> ) 144973-42-2P, Lithium manganese nickel oxide			
	(LiMn <sub>0.3</sub> Ni <sub>0.7</sub> O <sub>2</sub> ) 149887-20-7P, Lithium manganese nickel oxide			
	(LiMn <sub>0.1</sub> Ni <sub>0.9</sub> O <sub>2</sub> ) 163596-49-4P, Lithium manganese nickel oxide			
	(LiMn <sub>0.2</sub> Ni <sub>0.8</sub> O <sub>2</sub> ) 164175-46-6P, Aluminum lithium nickel oxide			
	(Al <sub>0.05</sub> LiNi <sub>0.95</sub> O <sub>2</sub> ) 164175-47-7P, Aluminum lithium nickel oxide			
	(Al <sub>0.2</sub> LiNi <sub>0.8</sub> O <sub>2</sub> ) 172484-40-1P, Aluminum lithium nickel oxide			
	(Al <sub>0.1</sub> LiNi <sub>0.9</sub> O <sub>2</sub> ) 179186-44-8P, Lithium manganese nickel oxide			
	(LiMn <sub>0.4</sub> Ni <sub>0.6</sub> O <sub>2</sub> ) 179802-95-0P, Cobalt lithium manganese nickel oxide			
	(Co <sub>0.1</sub> LiMn <sub>0.1</sub> Ni <sub>0.8</sub> O <sub>2</sub> ) 179802-96-1P, Cobalt lithium manganese nickel			
	oxide (Co <sub>0.2</sub> LiMn <sub>0.1</sub> Ni <sub>0.7</sub> O <sub>2</sub> ) 190902-69-3P, Aluminum lithium nickel oxide			
	(Al <sub>0.15</sub> LiNi <sub>0.85</sub> O <sub>2</sub> ) 193214-22-1P, Aluminum cobalt lithium nickel oxide			
	(Al <sub>0.05</sub> Co <sub>0.1</sub> LiNi <sub>0.85</sub> O <sub>2</sub> ) 193214-24-3P, Aluminum cobalt lithium nickel			
	oxide (Al <sub>0.05</sub> Co <sub>0.15</sub> LiNi <sub>0.8</sub> O <sub>2</sub> ) 193214-25-4P, Aluminum cobalt lithium			
	nickel oxide (Al <sub>0.05</sub> Co <sub>0.2</sub> LiNi <sub>0.75</sub> O <sub>2</sub> ) 193214-27-6P, Aluminum cobalt			
	lithium nickel oxide (Al <sub>0.05</sub> Co <sub>0.25</sub> LiNi <sub>0.7</sub> O <sub>2</sub> ) 193214-33-4P, Aluminum			
	cobalt lithium nickel oxide (Al <sub>0.1</sub> Co <sub>0.1</sub> LiNi <sub>0.8</sub> O <sub>2</sub> ) 193214-37-8P, Aluminum			
	cobalt lithium nickel oxide (Al <sub>0.1</sub> Co <sub>0.15</sub> LiNi <sub>0.75</sub> O <sub>2</sub> ) 193214-39-0P,			
	Aluminum cobalt lithium nickel oxide (Al <sub>0.1</sub> Co <sub>0.2</sub> LiNi <sub>0.7</sub> O <sub>2</sub> ) 193214-41-4P,			
	Aluminum cobalt lithium nickel oxide (Al <sub>0.1</sub> Co <sub>0.25</sub> LiNi <sub>0.65</sub> O <sub>2</sub> )			
	193214-44-7P, Aluminum cobalt lithium nickel oxide (Al <sub>0.15</sub> Co <sub>0.1</sub> LiNi <sub>0.75</sub> O <sub>2</sub> )			
	193214-45-8P, Aluminum cobalt lithium nickel oxide (Al <sub>0.15</sub> Co <sub>0.15</sub> LiNi <sub>0.7</sub> O <sub>2</sub> )			
	193214-46-9P, Aluminum cobalt lithium nickel oxide (Al <sub>0.15</sub> Co <sub>0.25</sub> LiNi <sub>0.6</sub> O <sub>2</sub> )			
	193214-47-0P, Aluminum cobalt lithium nickel oxide (Al <sub>0.2</sub> Co <sub>0.1</sub> LiNi <sub>0.7</sub> O <sub>2</sub> )			
	193214-48-1P, Aluminum cobalt lithium nickel oxide (Al <sub>0.2</sub> Co <sub>0.15</sub> LiNi <sub>0.65</sub> O <sub>2</sub> )			
	193214-49-2P, Aluminum cobalt lithium nickel oxide (Al <sub>0.2</sub> Co <sub>0.2</sub> LiNi <sub>0.6</sub> O <sub>2</sub> )			
	193214-50-5P, Aluminum cobalt lithium nickel oxide (Al <sub>0.2</sub> Co <sub>0.25</sub> LiNi <sub>0.55</sub> O <sub>2</sub> )			
	193214-51-6P, Aluminum cobalt lithium nickel oxide (Al <sub>0.15</sub> Co <sub>0.2</sub> LiNi <sub>0.65</sub> O <sub>2</sub> )			
	193214-53-8P, Cobalt lithium manganese nickel oxide			
	(Co <sub>0.15</sub> LiMn <sub>0.1</sub> Ni <sub>0.75</sub> O <sub>2</sub> ) 193214-55-0P, Cobalt lithium manganese nickel			
	oxide (Co <sub>0.25</sub> LiMn <sub>0.1</sub> Ni <sub>0.65</sub> O <sub>2</sub> ) 193214-56-1P, Aluminum lithium manganese			
	nickel oxide (Al <sub>0.05</sub> LiMn <sub>0.1</sub> Ni <sub>0.85</sub> O <sub>2</sub> ) 193214-57-2P 193214-58-3P			
	193214-60-7P 193214-63-0P 193214-64-1P, Aluminum lithium manganese			
	nickel oxide (Al <sub>0.1</sub> LiMn <sub>0.1</sub> Ni <sub>0.8</sub> O <sub>2</sub> ) 193214-66-3P 193214-69-6P			
	193214-71-0P 193214-73-2P 193214-75-4P, Aluminum lithium manganese			

nickel oxide (Al<sub>0.15</sub>LiMn<sub>0.1</sub>Ni<sub>0.75</sub>O<sub>2</sub>) 193214-77-6P 193214-79-8P  
 193214-80-1P 193214-83-4P 193214-86-7P, Aluminum lithium manganese  
 nickel oxide (Al<sub>0.2</sub>LiMn<sub>0.1</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 193214-88-9P 193214-89-0P  
 193214-91-4P 193214-94-7P 193215-00-8P, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.2</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 193215-03-1P, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.2</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 193215-05-3P, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.2</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-08-6P,  
 Cobalt lithium manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.2</sub>Ni<sub>0.55</sub>O<sub>2</sub>)  
 193215-11-1P, Aluminum lithium manganese nickel oxide  
 (Al<sub>0.05</sub>LiMn<sub>0.2</sub>Ni<sub>0.75</sub>O<sub>2</sub>) 193215-14-4P 193215-17-7P 193215-20-2P  
 193215-23-5P 193215-24-6P, Aluminum lithium manganese nickel oxide  
 (Al<sub>0.1</sub>LiMn<sub>0.2</sub>Ni<sub>0.7</sub>O<sub>2</sub>) 193215-25-7P 193215-27-9P 193215-28-0P  
 193215-30-4P 193215-32-6P, Aluminum lithium manganese nickel oxide  
 (Al<sub>0.15</sub>LiMn<sub>0.2</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 193215-33-7P 193215-34-8P 193215-35-9P  
 193215-36-0P 193215-38-2P, Aluminum lithium manganese nickel oxide  
 (Al<sub>0.2</sub>LiMn<sub>0.2</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-41-7P 193215-44-0P 193215-45-1P  
 193215-48-4P 193215-50-8P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.1</sub>LiMn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-51-9P, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.15</sub>LiMn<sub>0.3</sub>Ni<sub>0.55</sub>O<sub>2</sub>) 193215-53-1P, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 193215-54-2P, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.25</sub>LiMn<sub>0.3</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 193215-56-4P, Aluminum  
 lithium manganese nickel oxide (Al<sub>0.05</sub>LiMn<sub>0.3</sub>Ni<sub>0.65</sub>O<sub>2</sub>) 193215-58-6P  
 193215-60-0P 193215-62-2P 193215-64-4P 193215-66-6P, Aluminum  
 lithium manganese nickel oxide (Al<sub>0.1</sub>LiMn<sub>0.3</sub>Ni<sub>0.6</sub>O<sub>2</sub>) 193215-69-9P  
 193215-71-3P 193215-73-5P 193215-74-6P 193215-75-7P, Aluminum  
 lithium manganese nickel oxide (Al<sub>0.15</sub>LiMn<sub>0.3</sub>Ni<sub>0.55</sub>O<sub>2</sub>) 193215-77-9P  
 193215-79-1P 193215-82-6P 193215-83-7P 193215-84-8P, Aluminum  
 lithium manganese nickel oxide (Al<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 193215-85-9P  
 193215-87-1P 193215-88-2P 193215-89-3P 193215-92-8P, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 193215-94-0P  
 , Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.4</sub>Ni<sub>0.45</sub>O<sub>2</sub>)  
 193215-96-2P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 193215-97-3P, Cobalt lithium manganese nickel  
 oxide (Co<sub>0.25</sub>LiMn<sub>0.4</sub>Ni<sub>0.35</sub>O<sub>2</sub>) 193215-98-4P, Aluminum lithium manganese  
 nickel oxide (Al<sub>0.05</sub>LiMn<sub>0.4</sub>Ni<sub>0.55</sub>O<sub>2</sub>) 193216-00-1P  
 193216-02-3P 193216-03-4P 193216-05-6P 193216-08-9P,  
 Aluminum lithium manganese nickel oxide (Al<sub>0.1</sub>LiMn<sub>0.4</sub>Ni<sub>0.5</sub>O<sub>2</sub>)  
 193216-10-3P 193216-13-6P 193216-16-9P 193216-18-1P  
 193216-21-6P, Aluminum lithium manganese nickel oxide  
 (Al<sub>0.15</sub>LiMn<sub>0.4</sub>Ni<sub>0.45</sub>O<sub>2</sub>) 193216-24-9P 193216-26-1P 193216-30-7P  
 193216-32-9P 193216-34-1P, Aluminum lithium manganese nickel oxide  
 (Al<sub>0.2</sub>LiMn<sub>0.4</sub>Ni<sub>0.4</sub>O<sub>2</sub>) 193216-36-3P 193216-38-5P 193216-40-9P  
 193216-42-1P  
 RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)  
 (cathode active material for secondary lithium battery)

L3 ANSWER 133 OF 133 CAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 1996:262255 CAPLUS  
 DOCUMENT NUMBER: 124:321550  
 TITLE: Lithium-containing transition metal mixed oxides and  
 their manufacture and use  
 INVENTOR(S): Yoshio, Masayuki; Okada, Masaki; Mori, Takashi  
 PATENT ASSIGNEE(S): Tosoh Corp, Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 08037007	A2	19960206	JP 1995-58817	19950317
JP 3550783	B2	20040804		
PRIORITY APPLN. INFO.:			JP 1995-58817	A 19950317
			JP 1994-100997	19940516



AB The oxides are layer structured  $\text{Li}_x\text{Mn}_y\text{Co}_z\text{Ni}_{1-(y+z)}\text{O}_2$ , where  $0.9 < x \leq 1.2$ ;  $0.0 < y < 0.5$ ;  $0.0 \leq z < 0.5$ ; and  $0.0 < (y+z) \leq 0.5$ .  
The oxides are prepared by heat treating compds. of Li and transition metals, where the Mn compound is a  $\text{Mn}^{3+}$  compound, preferably  $\gamma\text{-MnOOH}$ .  
The oxides are used for cathodes in Li batteries.

ST battery lithium manganese nickel oxide cathode; cobalt lithium manganese nickel oxide cathode

IT Cathodes  
(battery, trivalent manganese compds. in manufacture of cobalt lithium manganese nickel oxides for battery cathodes)

IT 149887-20-7P, Lithium manganese nickel oxide ( $\text{LiMn}_{0.1}\text{Ni}_{0.9}\text{O}_2$ )  
163596-49-4P, Lithium manganese nickel oxide ( $\text{LiMn}_{0.2}\text{Ni}_{0.8}\text{O}_2$ )  
176206-89-6P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.3}\text{LiMn}_{0.2}\text{Ni}_{0.5}\text{O}_2$ )  
176206-90-9P, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.05}\text{Li}_{1.1}\text{Mn}_{0.2}\text{Ni}_{0.75}\text{O}_2$ ) 176304-96-4P, Cobalt lithium manganese nickel oxide ( $(\text{Co,Mn})_{0.5}\text{Li}_{0.9-1.2}\text{Ni}_{0.5-1}\text{O}_2$ )  
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(trivalent manganese compds. in manufacture of cobalt lithium manganese nickel oxides for battery cathodes)

IT 1308-06-1, Cobalt oxide ( $\text{Co}_3\text{O}_4$ ) 1310-65-2, Lithium hydroxide  
12025-99-9, Manganese hydroxide oxide ( $\text{Mn}(\text{OH})\text{O}$ ) 12054-48-7, Nickel hydroxide  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(trivalent manganese compds. in manufacture of cobalt lithium manganese nickel oxides for battery cathodes)